

THE AUTOMOBILE

Attains Giant's Growth in Decade

Government Statistics Show Value of Automobile Output Has Increased 5,148.6 Per Cent. Between 1899 and 1909—
Outdistances All Other Industries

Figures Indicate Increase of 3,278.9 Per Cent. in the Number of Wage-Earners

PERCENTAGE INCREASE IN VALUE OF
PRODUCTS OF LEADING INDUSTRIES

1899 to 1909 Position	Industry	Per cent.
1—	Automobiles, Bodies, Parts.....	5,148.6
2—	Copper, Tin & Sheet Iron.....	155
3—	Cotton Seed Products.....	151.8
4—	Women's Clothing.....	141.5
5—	Electrical Apparatus.....	139.4
6—	Copper, Smelting & Refining.....	129.4
7—	Bread Products.....	126.3
8—	Confectionery.....	122.3
9—	Gas, Light & Heat.....	120.3
10—	Liquors, Distilled.....	111.5
11—	Paper & Pulp.....	110.2
12—	Butter & Dairy Products.....	109.9
13—	Knit Goods.....	108.8
14—	Petroleum, Refining.....	91.2
15—	Blast Furnaces, Iron & Steel.....	89.3
16—	Chemicals.....	87.6
17—	Printing & Publishing.....	86.7
18—	Railroads & Steamboats*.....	86
19—	Cotton Goods.....	85.3
20—	Furniture.....	83.6
21—	Silk.....	83.6
22—	Paint & Varnish.....	79.5
23—	Marble & Stone.....	77.6
24—	Boots & Shoes.....	76.8
25—	Flour Mill Products.....	76.2

* Car and general ship construction and repairs by steam railroad and steamship companies.

PERCENTAGE INCREASE IN WAGE EARNING OF
LEADING INDUSTRIES

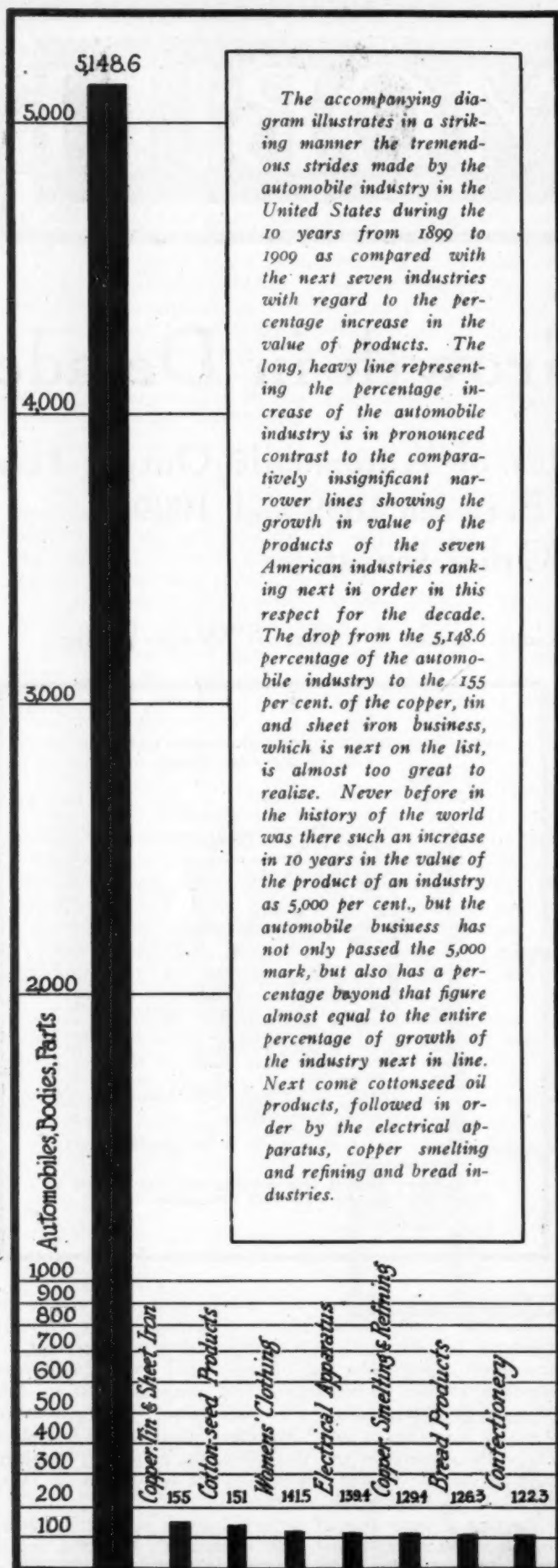
1899 to 1909 Position	Industry	Per cent.
1—	Automobiles, Bodies, Parts.....	3,278.9
2—	Electrical Apparatus.....	107.7
3—	Copper, Tin & Sheet Iron.....	92.1
4—	Women's Clothing.....	83.6
5—	Distilled Liquors.....	72.8
6—	Bread Products.....	66.5
7—	Confectionery.....	66.2
8—	Gas, Light & Heat.....	65.7
9—	Railroad & Steamboats*.....	62.5
10—	Marble & Stone.....	57.4
11—	Cotton Seed Products.....	55.1
12—	Knit Goods.....	54.5
13—	Paper & Pulp.....	53
14—	Men's Clothing.....	52.1
15—	Silk.....	51.4
16—	Brass & Bronze.....	49.5
17—	Paint & Varnish.....	46.8
18—	Butter & Dairy Products.....	44
19—	Furniture.....	41.8
20—	Liquor, Malt.....	38.3
21—	Copper, Smelting & Refining.....	38.8
22—	Lumber & Timber.....	36.6
23—	Printing & Publishing.....	32.4
24—	Boots & Shoes.....	31.1
25—	Iron & Steel Works & Mills.....	21

* Car and general ship construction and repairs by steam railroad and steamship companies.

WASHINGTON, D. C., March 25—According to a statement issued by the director of census, Department of Commerce and Labor, the automobile industry leads the industries of the United States in the percentage of increase in the value of products and in the percentage of increase in wage earning for the 10 years from 1899 to 1909. The standing of the twenty-five industries next in order in these respects is shown in the accompanying tables. But the difference between the rate of increase of the automobile industry and that of the industry ranking next to it in each instance is so great that the most disinterested person cannot fail to realize in some degree the magnitude to which the business of building motor vehicles has grown in the limited number of years during which it has been in existence.

The copper, tin and sheet iron business approaches nearest the automobile industry in percentage of increase in the value of products, but the automobile products show a percentage increase of 5,148.6, while that of the copper, tin and sheet iron products amounts to a comparatively insignificant 155, or less than one-thirty-third of the percentage gained by the automobile industry from 1899 to 1909. The other industries fall into place below the copper, tin and sheet iron, the percentage dropping at more or less regular intervals to the twenty-fifth in rank, flour mill products, which has 76.2.

As regards percentage of increase in wage earning, the automobile industry stands first, with a percentage of 3,278.9, and is followed by the electrical apparatus business, with a percentage of 107.7, or one-thirtieth of the increase of the motor car in-



NUMBER OF WAGE EARNERS IN LEADING INDUSTRIES

Position	Industry	Wage earners
1	Lumber & Timber	695,019
2	Foundry & Machine Shop	531,011
3	Cotton Goods	378,880
4	Railroads & Steamboats*	282,174
5	Printing & Publishing	258,434
6	Iron & Steel Works & Mills	240,076
7	Men's Clothing	239,696
8	Boots & Shoes	198,297
9	Woollen Goods	168,722
10	Tobacco	156,810
11	Women's Clothing	153,743
12	Knit Goods	129,275
13	Furniture	128,452
14	Bread	100,216
15	Silk	99,037
16	Meat Packing	89,728
17	Paper & Pulp	89,492
18	Electrical Apparatus	87,256
19	Automobiles, Bodies, Parts	75,721
20	Copper, Tin & Sheet Iron	73,615
21	Carriages & Wagons	69,928
22	Marble & Stone	65,603
23	Leather	62,202
24	Canning & Preserving	59,968
25	Liquors, Malt	54,379
26	Agricultural Implements	50,521
27	Confectionery	44,638

*Car and general ship construction and repairs by steam railroad and steamship companies.

dustry. Copper, tin and sheet iron is third with a percentage of 92.1, and the other industries follow, the difference between their respective percentages being considerably greater than those in the table relating to increase in the value of products. The twenty-fifth industry in the wage earning list is that carried on by the iron and steel works and mills, which has a percentage of increase of 21.

The statement issued by the Department of Commerce and Labor contains a table of the standing of the forty-three leading industries in the United States, together with the totals of all other industries for the period from 1899 to 1909. This table is shown on page 781. The statement points out that the number of workmen is one of the best measures of the relative importance of manufacturing. The census of 1909, upon which the figures are based, was confined to manufacturing establishments conducted under the factory system, as distinguished from the neighborhood, hand and building industries. Therefore, the statement shows the relative importance of the leading manufacturing industries in the United States, each having a gross value of products of \$100,000,000 or more in 1909. The table mentioned above shows the average number of workmen of each of these industries, the value of the products, the value added by manufacture, which is obtained by deducting the cost of materials consumed from the value of the products, beside the percentages of increase in the average number of workmen and in the value of the products.

To facilitate the analysis of the situation in 1909 as shown in the table included in the statement of the census authorities, and to throw light upon the facts revealed therein from different angles, THE AUTOMOBILE has arranged the accompanying five special tables, each of which is devoted to one phase only of the situation as regards the twenty-five leading industries. It is significant that the automobile industry is to be found among the leading twenty-five in each instance, in spite of being the youngest of the industries mentioned, some of which are not to be found on all the lists.

Many Men on Industry's Payrolls

With reference to value added by manufacture, the automobile stands seventeenth, foundry and machine shop products being first on the list with \$688,464,000, as compared with \$117,556,000 for the automobile industry. Even then, the automobile industry is considerably ahead of copper, tin and sheet iron.

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When the census was taken in 1909, factories engaged in the automobile industry were giving employment to only 75,721 men as compared with 695,019 in the lumber and timber business and 531,011 in foundries and machine shops. Still, even 75,000 men would make a good-sized army, and their names constituted a payroll of which any industry less than a score of years old might well be proud. At the present day there are over 100,000 men employed in automobile factories all over the country. As may be seen in the table, the automobile industry ranked nineteenth with respect to the number of workmen employed in 1909.

1911 Output, 209,957 Cars

IN value of products the automobile industry is still farther down the list, standing twenty-second with \$249,202,000, an enormous sum when considered by itself, but which fades into insignificance when compared with \$1,370,568,000, the value of the products of the meat packing industry, or with \$1,228,475,000, that of the foundries and machine shops. Even the value of lumber and timber products \$1,156,129,000, makes that of the automobile output seem small. Still, it must be remembered that this was in 1909, when the number of cars manufactured was only some 119,000, whereas the 1911 output was 209,957 cars, and the manufacturers state that they expect to complete 247,427 automobiles during 1912. Of course, that would make the gross value only about half a billion dollars for the present year, but it shows how rapidly the industry is growing. It may be noticed in examining the table illustrating the comparative value of products of the different industries that the carriage and wagon industry, vast as it is, is much farther down the line than the automobile industry, though, of course, the individual automobiles produced have a much higher average value than the carriages and wagons.

In comparing the tables it is seen that some of the industries which stand well up at the top of the list in gross value of products rank comparatively low in the average number of workmen employed and in the value added by manufacture. This indicates that the cost of the materials represents a relatively large proportion of the total value of the products, and consequently that the value added by manufacture, of which wages usually constitute the largest item, is not commensurate with the total value of the products. Thus the meat packing industry, which ranks first in the gross value of products, and the flour mill products, which hold fifth place in that respect, both rank comparatively low with regard to the number of workmen and the value added by manufacture. The blast furnace industry, the smelting and refining of copper, the manufacture of sugar and molasses, the manufacture of butter and other dairy products, the refining of petroleum, and the smelting and refining of lead are other industries which rank much higher in the gross value of their products than in the number of workmen or in the value added by manufacture. In these respects it is seen that the automobile industry ranks first and seventeenth, re-

STATISTICS OF THE 43 LEADING INDUSTRIES OF THE UNITED STATES FOR THE DECADE FROM 1899 TO 1909

Industries	Wage Earners Average Number	Position	Value of Products Amount	Position	Value Added by Manufacture Amount	Position	Average Number Wage-Earners 1899-1909	Value of Products 1899-1909
Slaughtering & meat packing....	89,728	16	\$1,370,568,000	1	\$168,740,000	12	29.5	73.8
Foundry & machine shop products....	531,011	2	1,228,475,000	2	688,464,000	1	24.4	53.9
Lumber & timber products....	695,019	1	1,156,129,000	3	649,011,000	2	36.6	51.9
Iron & steel, steel works and rolling mills....	240,076	6	965,723,000	4	328,222,000	4	31.0	65.1
Flour mills & grist mills products....	39,453	30	883,584,000	5	116,008,000	18	22.4	76.2
Printing & publishing....	258,434	5	737,576,000	6	536,101,000	3	32.4	86.7
Cotton goods, including cotton, small wares....	378,680	3	628,202,000	7	257,383,000	7	25.1	85.3
Clothing, men's, including shirts, boots & shoes, including cut	239,696	7	668,077,000	8	270,562,000	6	32.1	75.4
stock and findings....	198,297	8	512,798,000	9	180,060,000	10	31.1	76.8
Woolen, worsted & felt goods, & wool hats....	168,722	9	435,979,000	10	153,101,000	15	29.1	75.2
Tobacco manufacture....	166,810	10	416,695,000	11	239,509,000	8	25.9	58.0
Car and general ship construction & repairs by steam-railroad co's.	282,174	4	405,601,000	12	206,188,000	9	62.5	86.0
Bread and other bakery products....	100,216	14	306,565,000	13	158,831,000	14	66.5	126.3
Iron & steel, blast furnaces....	38,429	31	391,429,000	14	70,791,000	30	-2.1	89.3
Clothing, women's....	153,743	11	384,752,000	15	175,964,000	11	83.6	141.5
Smelting & refining copper....	15,628	38	378,806,000	16	45,274,000	36	38.0	129.4
Liquors, malt....	54,579	25	374,730,000	17	278,134,000	5	38.3	56.2
Leather, tanned, curried & finished....	62,202	23	327,874,000	18	79,595,000	27	19.4	60.7
Sugar & molasses, not including beet sugar....	13,526	41	279,249,000	19	31,666,000	41	-4.3	16.5
Butter, cheese & condensed milk....	18,431	36	274,558,000	20	39,012,000	39	44.0	109.9
Paper & wood pulp....	89,492	17	267,657,000	21	102,215,000	21	53.0	110.2
Automobiles, including bodies & parts....	75,721	19	249,202,000	22	117,556,000	17	3278.9	5148.6
Furniture & refrigerators....	128,452	13	229,887,000	23	131,112,000	16	41.8	83.6
Petroleum refining....	13,929	40	226,908,000	24	37,725,000	40	14.2	91.2
Electrical machinery, apparatus & supplies....	87,256	18	221,309,000	25	112,743,000	20	107.7	139.4
Liquors, distilled....	6,430	43	204,699,000	26	168,722,000	13	72.8	111.5
Hosiery & knit goods....	129,275	12	200,144,000	27	89,903,000	23	54.5	108.8
Copper, tin, sheet iron products....	73,615	20	199,824,000	28	87,242,000	25	92.1	155.0
Silk & silk goods, including trowsters....	99,037	15	196,912,000	29	89,145,000	24	51.4	83.6
Smelting & refining, lead....	7,424	42	167,406,000	30	15,443,000	43	-10.8	4.6
Gas, illuminating & heating....	37,215	32	166,814,000	31	114,386,000	19	65.7	120.3
Carriages & wagons & materials....	69,928	21	159,893,000	32	77,942,000	28	-5.3	15.6
Canning & preserving....	59,968	24	157,101,000	33	55,278,000	31	5.2	58.2
Brass & bronze products....	40,618	29	149,989,000	34	50,761,000	34	49.5	69.2
Oil, cottonseed & coke....	17,071	37	147,868,000	35	28,035,000	42	55.1	151.8
Agricultural implements....	50,551	26	146,529,000	36	86,022,000	26	8.5	44.6
Patent medicines & compounds & druggists' preparations....	22,895	35	131,942,000	37	91,566,000	22	20.3	69.9
Confectionery....	44,638	27	134,796,000	38	53,645,000	32	66.2	122.3
Paint & varnish....	14,240	39	142,889,000	39	45,573,000	35	46.8	79.5
Cars, steam railroad, not including operations of railroad companies....	43,086	28	123,730,000	40	44,977,000	37	28.8	36.7
Chemicals....	23,714	34	117,689,000	41	53,567,000	33	34.7	87.6
Marble & stone work....	65,603	22	113,093,000	42	75,696,000	29	57.4	77.6
Leather goods....	34,907	33	104,719,000	43	44,692,000	38	19.2	73.3
All other industries....	1,634,927	..	4,561,002,000	..	2,084,399,000	..	46.9	100.7
Total, all industries....	6,615,046	..	\$20,672,052,000	..	\$8,530,261,000	..	40.4	81.2

spectively, or at least did so at the time the census was taken in 1909. The low standing as regards the value added by manufacture is due, in some degree, to the expensive quality of the material necessary for the construction of the automobile and especially to the high wages commanded by skilled mechanics, the men whose brains and muscles are indispensable to the automobile makers. Owing to these facts, the automobile industry may be classed with several other industries similarly situated and affected. The rank of these industries, according to the number of workmen and the value added by manufacture, is higher than their rank according to the value of their products. Besides the automobile industry, the making of women's clothing, furniture, electrical machinery, apparatus and supplies, hosiery and knit goods, agricultural implements and the confectionery and marble and stone work industries may be included in this category.

The census bureau statement explains that the figures in the large table for both the value of products and the value added by manufacture include, in the case of the brewery and distillery industries, a very large amount of tax paid to the United States

VALUE OF PRODUCTS OF LEADING INDUSTRIES

Position	Industry	Value of products
1	Meat Packing	\$1,370,568,000
2	Foundry & Machine Shop	1,228,475,000
3	Lumber & Timber	1,156,129,000
4	Iron & Steel	985,723,000
5	Flour Mill Products	883,584,000
6	Printing & Publishing	737,876,000
7	Cotton Goods	628,392,000
8	Men's Clothing	568,077,000
9	Boots & Shoes	512,798,000
10	Woollen Goods	435,979,000
11	Tobacco	416,695,000
12	Railroads & Steamboats*	405,601,000
13	Bread	396,865,000
14	Blast Furnaces, Iron & Steel	391,429,000
15	Women's Clothing	384,752,000
16	Copper, Smelting & Refining	378,806,000
17	Liquors, Malt	374,730,000
18	Leather	327,874,000
19	Sugar & Syrup	279,749,000
20	Butter & Dairy Products	274,558,000
21	Paper & Pulp	267,657,000
22	Automobiles, Bodies, Parts	249,202,000
23	Furniture	239,887,000
24	Petroleum	236,998,000
25	Electrical Apparatus	221,309,000
32	Carriages & Wagons	159,893,000
36	Agricultural Implements	146,329,000

*Car and general ship construction and repair by steam railroad and steamship companies.

VALUE ADDED BY MANUFACTURE

Position	Industry	Added value
1	Foundry & Machine Shop	\$688,464,000
2	Lumber & Timber	648,011,000
3	Printing & Publishing	536,101,000
4	Iron & Steel Works & Mills	328,222,000
5	Liquors, Malt	278,134,000
6	Men's Clothing	270,562,000
7	Cotton Goods	257,383,000
8	Tobacco	239,509,000
9	Railroads & Steamboats*	206,188,000
10	Boots & Shoes	180,060,000
11	Women's Clothing	175,964,000
12	Meat Packing	168,740,000
13	Liquors, Distilled	168,722,000
14	Bread	158,831,000
15	Woollens	153,101,000
16	Furniture	131,112,000
17	Automobiles, Bodies, Parts	117,556,000
18	Flour Mill Products	116,008,000
19	Gas, Light & Heat	114,386,000
20	Electrical Apparatus	112,743,000
21	Paper & Pulp	102,215,000
22	Patent Medicines	91,556,000
23	Knit Goods	89,903,000
24	Silk	89,145,000
25	Copper, Tin & Sheet Iron	87,242,000

*Car and general ship construction and repairs by steam railroad and steamship companies.

government, and are therefore misleading as an indication of the relative importance of these industries from a purely manufacturing standpoint. Their importance is best shown by their rank in the column of the table showing the number of workmen. In this respect the brewery industry ranks twenty-fifth among the industries of the country, and the distillery industry is forty-third.

There are very great differences between the various industries with regard to the percentages of increase in wage earning and in the value of the products. The great majority of the industries, however, show an increase in both items for the decade, the exceptions being the iron and steel industry, blast furnaces, sugar and molasses and carriages and wagons, which decreased in the average number of workmen, and smelting and refining lead, which decreased in the average number of workmen and in the value of the products as well.

By far the greatest percentages of increase are shown for the automobile industry, the gross value of the profits increasing more than fifty-fold between 1899 and 1909. And these figures take in only the manufacturers of automobiles, motor trucks, bodies and parts, the great army of automobile fitting and accessory makers, to say nothing of the automobile rubber tire industry. An idea of the magnitude of the accessory side of the industry may be gained from the facts that there are nearly a thousand manufacturers, the total capitalization of their companies amounting to over \$200,000,000 without counting the rubber tire companies. The value of the accessory makers' products for the year 1911 was \$255,202,000 and for 1912 it should be much more. New companies are being incorporated daily all over the country and new factories are rapidly being put in operation.

Of course, the figures given at the end of the last paragraph are much more up to date than those of the census bureau. The census was taken in 1909, and, consequently, it must be kept in mind that conditions in the automobile industry today differ materially from those which are revealed in the census report for the decade ending in 1909. Great expansion has taken place all over the country, and practically every factory has been enlarged several times since the census was taken, and, of course, has increased the number of workmen in its employ and also the gross value of its product. American cars are being sold in increasing numbers in foreign lands and the domestic demand seems to be brisker than ever this spring. Automobiles are being turned out in greater quantities and of better quality than ever before. Whole trainloads of them are shipped from the factories

every day and only recently the manufacturers have had trouble in securing enough cars to ship their products to different parts of the country. Yes, the automobile industry has grown considerably since 1909, but the census report for the 10 years from 1899 to 1909 is very valuable, not only because it shows the status of the industry at the end of that time but also because it reveals so clearly the tremendous growth which characterized the industry in the first decade of the twentieth century and which is proceeding so rapidly at the present time.

United States Leads in Export Gain

The export figures for the four great automobile producing countries of the world—United States, France, Great Britain and Germany—which have recently been made public, show that the United States has increased its export within the last 12 months at a rate far in excess of the other three countries named. In 1910 the total automobile export trade of this country amounted to \$13,190,296, while in 1911 the total had increased to \$19,178,484, a gain of 45 per cent.

Germany, which in the year 1910 totalled \$12,356,000 in exports, increased its trade in this particular direction to \$16,581,000, a gain of 34.20 per cent.

Great Britain, which in 1910 led Germany with a total of \$13,028,635 in exports of automobiles and parts, increased its figures for 1911 to \$15,928,585, a gain of 22.95 per cent., but falling behind Germany's figures over one-half million dollars in totals.

The most peculiar phase of the comparison, however, is shown by a study of France's exports during the same period. With a total of \$35,027,763 for the year 1910, the following year showed an increase of but \$257,813, representing a gain of but 0.75 per cent. In this connection, the figures by months show that for the first six months France's total indicated an increase of fully 12 per cent. over that of the preceding year, but during the last half of 1911 its foreign trade fell off considerably.

Following is a tabulation showing the exports of the four countries named during 1910 and 1911, with the percentage of increase for each:

	1910	1911	Percentage of Gain
United States	\$13,190,296	\$19,178,484	45.00
Germany	12,356,000	16,581,000	34.20
Great Britain	13,028,635	15,928,585	22.95
France	35,027,763	35,285,576	.75
Totals	\$73,602,694	\$86,974,645

Quakers' New Traffic Rules

Philadelphia's Police Have Adopted the London System of Regulating Street Travel with Great Success

PHILADELPHIA, March 25—Adopting the ideas of London traffic regulators, the police are compelling drivers to make the circuit of the "aisles of safety" in turning into main thoroughfares. Instead of driving inside the safety stands where pedestrians wait for a chance to cross the street, the drivers must now pass on the outside of them. The line in one of the photographs shows how the police now compel drivers to make this wide detour in rounding corners. The new rule has caused considerable confusion and there have been many clashes between the traffic regulators and drivers, who either cannot or will not see what is meant by the new rule. The motor drivers have been the chief offenders. All have been compelled to fall in line with the new rule and there has been much murmuring and discontent. The education of the motor drivers, however, goes on, and in time the trouble will be smoothed out.

Atlanta Hill-Climb Early in May

ATLANTA, GA., March 21—The Atlanta Automobile and Accessory Dealers' Association, at a meeting here last night, decided not only to hold a hill-climb early in May, but also to charter a special car to go to the Indianapolis race on Decoration Day.

The exact date of the hill-climb will be decided at a meeting of the hill-climb committee, composed of L. S. Crane, B. S. Abbott and Wylie West, which will be held next week. It has been informally decided that the affair shall be for stock cars, under the A. A. A. rules and under a price classification.

Road Race May Replace Track Events

Road races under auspices of the Minnesota State Automobile Association are possible for next fall as a result of the announcement by the state fair board that one afternoon only will be reserved for automobiles and that the feature will be a decorated machine parade, next fair week. The board gave two days last year to track racing on the one-mile course. The board announcement is that circular track racing is opposed through the country because of danger, notwithstanding the fact that the Minnesota track is one of the best dirt roads in the country on which records have been broken time and time again. Inasmuch as the state fair board is not in good standing with the state association it is said by officials of the automobilists that it is not probable the fair can have racing, unless it is outlaw.

Gets This Year's Glidden

New Orleans Secures Tour to Finish There—Northwest Clubs Were Also Hot After the Event

NEW ORLEANS, March 25—The New Orleans Automobile Dealers' Association has secured for this city the honor of being the terminus of the 1912 Glidden Tour.

A pledge of \$4,500 guarantee was required. It was announced that the route will lay through Memphis although no city has as yet been selected for the start of the tour. The trip to Panama as a part of the tour was abandoned although it is expected that many will make the voyage leaving their cars in New Orleans. A handsome loving cup will be presented by a local bank to the first car entering the city. Many plans for the entertainment of the participants in the tour are being worked out. The dealers' association has contributed \$500 to the necessary fund and more than 100 automobile owners have subscribed.

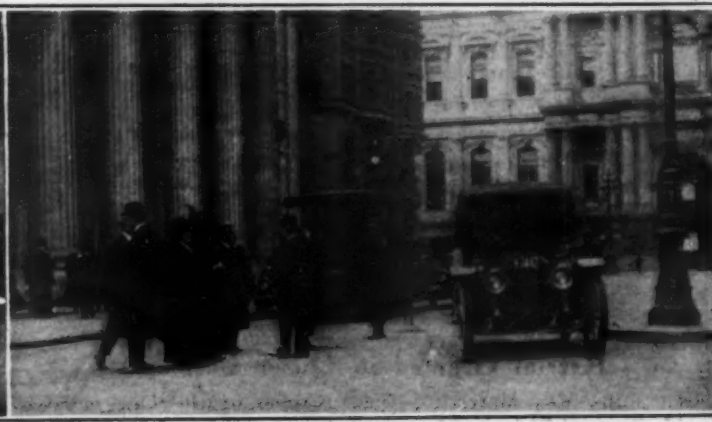
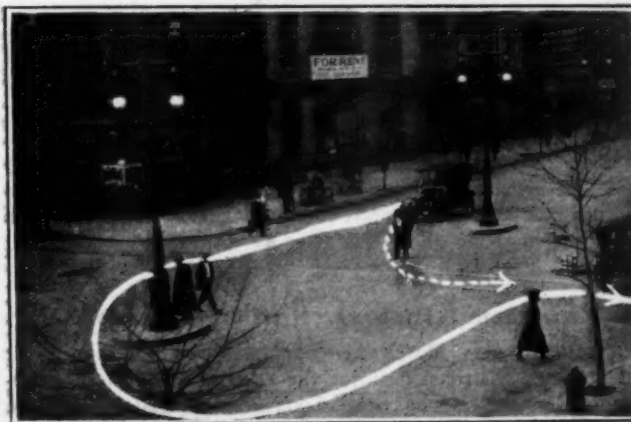
Suggests Route Through Yellowstone

MINNEAPOLIS, MINN., March 25—H. A. Noble, general passenger agent for the Great Northern Railway, suggests that the A. A. A. 1912 reliability run for 1912 be a "Seeing America First" tour from the Twin Cities to the North Pacific coast. It is proposed that the route be either through the Yellowstone park district or Helena. Last year the Great Northern ran a hotel train with the state tour of 1,200 miles, providing all meals and lodgings.

The Grand Forks Automobile Club is interesting the North Dakota State Automobile Association and individual clubs in an effort to get the 1912 A. A. A. reliability run to pass through that state. An emissary will be sent to Minneapolis.

Route Set for the Little Glidden

DES MOINES, IA., March 25—A tentative route for the Des Moines Little Glidden tour, which this season will develop into an all-state endurance run, has been decided upon by W. E. Moyer, president of the Iowa Automobile Association. The tour will start from Des Moines some time in June and will follow the River-to-River road to Council Bluffs, where the tourists will cross the river to Omaha to be entertained by Omaha club. Returning to the Iowa side of the river, the tour will proceed to Sioux City, whence one of the northern cross-state roads will be followed to Dubuque and Keokuk. From Keokuk the tour will return to Des Moines over the Waubesa trail.



Regulating Philadelphia's traffic—Dotted line shows old lines for turning; the other shows the new method. The policeman directs travel without whistle or baton

In the Legal Field

Campbell Bill, if Passed, Would Compel Manufacturers to Stamp Everything Sold Outside of State

Creditors of Züst Concern Compromise Claims for 15 Per Cent.—Cut-Out Ordinance Postponed

WASHINGTON, D. C., March 24—If the Campbell bill, H. R., 16,844 is enacted by Congress any manufacturer doing an interstate business stands in danger of going to prison unless he causes to be stenciled, printed or embossed upon every article manufactured by him, his name and address.

If any other person, firm or corporation erases the manufacturer's name, he, they or it may be subjected to penalty.

It also provides that anybody offering for sale or rent any property intended for interstate or foreign commerce shall furnish the name and address of the maker of such property.

The bill contains a clause providing for a fine of not more than \$1,000 or imprisonment for not more than 6 months or both, such penalties to be inflicted as the court may direct.

The possibilities of the Campbell bill are very wide. Under its limitations many automobile manufacturers and almost all accessory manufacturers may be placed in jeopardy. Under such a law it is conceivable that the mere fact that a car carries its trade name on the hub-cap may prove no protection except as far as the hub-cap is concerned. If the car happens to come within the classification known as assembled, the situation is grave. Such an automobile would have to carry the names and addresses of the makers of every part. Some of the manufacturers in lightly discussing the measure said that if it were enacted, the embossed names of all the various makers of the several parts of an assembled car might be decoratively utilized.

Züst Creditors Accept 15 Per Cent.

Composition of the debts of the Züst Motor Company was made and accepted Monday in the United States District Court and the discharge of the company from bankruptcy is now only a matter of formal action. The adjudicated and proved-up claims against the concern amounted to about \$37,000, and under the terms of the composition settlement will be made on a basis of 15 per cent.

While nothing definite has been made in the way of an announcement as to future developments, it is understood that a reorganization is in prospect and that the Züst line will be handled in New York before the selling season has gone much further.

Cut-Out Ordinance Postponed

Action on the muffler cut-out ordinance now pending before the New York aldermen has been postponed until Tuesday, when it is expected that the substitute measure recommended by the Touring Club of America will be enacted without opposition. The ordinance provides that every car shall be equipped with a muffler and that it shall be unlawful to use the cut-out under penalty of a fine of \$10, in default of which the offender may be sent to jail.

Retrial Granted in Queer Case

RICHMOND, VA., March 25—Judge Crump of the Law and Equity Court of Richmond has granted a new trial in the suit of John A. Coke, Jr., against the Gordon Motor Company. In this

case several interesting law points are involved which have never been finally determined by a Virginia court.

Mr. Coke bought an automobile some time ago from the Gordon Motor Company, which he alleges did not come up to the specifications, and after an extended and hotly contested suit, a jury rendered a verdict of damages in the sum of \$3,150 in favor of Coke. Motion to set aside the verdict was pending when Judge Ingram, who heard the suit, became ill and died.

Judge Crump holds, in effect, that he is without authority to enter a judgment in the case, which he had not himself heard, and that he has been unable to review the case since neither side had furnished him a complete stenographic transcript of the evidence taken.

The case is again placed upon the docket upon the original issues.

Take Sting from Tire-Dating Bill

The tire-dating bill has had its teeth pulled in the New York legislature and now may be passed without causing anybody any uneasiness. The operation was radical, but was kindly and expeditiously performed, and aside from extracting the incisors and molars, the addition of two futile tails made the whole measure a joke.

The amendments tacked on relieve the manufacturer from any responsibility for dating the tires and place the responsibility upon the retail dealers. As the retailer has no means of knowing the date of manufacture, the situation is rendered opaque. It also allows the dealer to apply the date with a rubber stamp in some inconspicuous place. The other amendment provides for the measure taking effect January 1, 1914.

Test Case to Define Chauffeur

MINNEAPOLIS, MINN., March 25.—To get a definition of the word chauffeur in the new Minnesota state automobile law members of the Minneapolis Automobile Show Association have decided to back a test case to the Supreme Court if necessary. G. A. Will, attorney for the Automobile Club of Minneapolis, is chosen to act as counsel. The action follows several arrests of men driving cars under the orders of the superintendent of police, in both of the Twin Cities. Men driving cars who were not owners, or who could not show chauffeur's license tags, were arrested. Several pleaded guilty, but automobile men employing testers, demonstrators and shop men who deliver cars to freight depots saw the danger of being involved in heavy expense which they deem not proper, and a consultation with the police resulted in the decision to get judicial determination of the meaning of the word chauffeur. The case is set for 9 a. m., March 29. The man chosen is a mechanic at the H. E. Wilcox Motor Car Company factory.

Scotching the Patent Monopoly

WASHINGTON, D. C., March 27—Representative Prouty, of Iowa, has introduced a bill to reform the scope and extent of patents. One amendment is directed to prevent patentees or licensees under patents from insisting by contract with distributors that a certain level of prices shall be maintained. Prouty states that his amendment will leave patentees the right to collect royalties, but will deprive them of the right to maintain monopolies to follow the goods after manufacture.

German Krupp vs. Pittsburgh Krupp

PITTSBURGH, PA., March 25—Suit has been entered in the United States District Court for the District of Western Pennsylvania by the Krupp Steel Company, of Essen, Germany, against the Krupp Motors Company, a new concern of Pittsburgh, to prevent the use of the name Krupp by the automobile company.

The suit is brought under the trademark act and the complaint alleges illegal use of the name.

Thomas Prosser, of the American Krupp headquarters, said that according to his information the Krupp Motors Company had not started manufacturing; that it had nobody connected with it named Krupp and that the company so far had entered into no contract with the Essen company to supply its steel.

Running Down Automobile Lottery

BUFFALO, N. Y., March 25—During the past week members of the automobile firm here of the Overland-Buffalo Company were summoned to court before Justice Brennan charged with knowing something of an alleged game of chance and lottery in which a motor car was the principal figure. It was brought out that an automobile had been purchased by a man whose name was withheld and that man had arranged with the Quality Press Company, local printers, for the printing of cards calling for a chance on an automobile, drawing to take place on June 1. Then, it was alleged, the printers sold the cards to merchants who in turn presented the cards to customers who bought merchandise amounting to a certain figure. Howard B. Smith, president of the Overland-Buffalo Company, declared his only part in the case was the sale of the machine. The hearing was adjourned.

Seek to Enjoin Pursell and Asch

Motions for preliminary injunctions against Pursell and Asch will be argued before the United States District Court for the Southern District of New York on Friday on behalf of the Weed Chain Tire Grip Company. Both defendants have been sued by the Weed company for alleged infringement of the Parsons non-skid patent and temporary restraining orders have been granted.

The substance of the motions to be disposed of is to enjoin the defendants during the entire pendency of the suits. The cases have been fully outlined in these columns heretofore.

Charges Fraud in Car Purchase

BUFFALO, N. Y., March 27.—Albert Poppenberg, local automobile dealer, is complainant in a peculiar case here against Frank Pelcynski, a former business man of this city. Some time ago Pelcynski purchased a motor car from the Poppenberg Company. The machine was valued at \$1,200, but Mr. Pelcynski paid \$300 down, gave a small mortgage in real estate for security and promised to make monthly payments until the total cost of the automobile had been paid. Then Pelcynski had the machine insured for more than its value, but a short while afterward the machine was destroyed by fire. It was learned that Pelcynski collected the insurance, but Poppenberg never received the balance due on the machine.

Another Dyer License Granted

G. S. Bradt, a Brooklyn automobile owner has been granted a Dyer license without suit. Mr. Bradt has an assembled car. Answers in the basic suits are due April 1, but it is regarded as likely that another stipulation postponing the time for answer will be agreed upon. In that case it is not probable that the cases will reach a hearing until the fall terms of the United States District Court.

Carhartt Has Put House in Order

The affairs of the Carhartt Automobile Sales Company have been finally settled by Judge Holt in the United States District Court, who has signed an order discharging the receiver and cancelling his bond. All accounts of the defunct company are said to have been adjusted.

Simplex Wins Case

Interference in Patent Decided Against Packard Representative—Another Dyer License Granted

Moving Automobiles Over Railroad Track Under Own Power Comes Under Interstate Act

WASHINGTON, D. C., March 23—The court of appeals for the District of Columbia has handed down a decision in the interference declared by the patent office between the patent of Edward J. Gulick, then employed by the Simplex Motor Car Company, Mishawaka, Ind., and Russell D. Huff, of the Packard Motor Car Company, of Detroit, for a patent on rear axle construction, one of the points of which was a device to prevent leakage of oil from the axle to the rear wheel spokes. Gulick's claim, No. 904,774, was granted November 24, 1908, "for improvements in transmission gear casings for motor cars." Huff filed an application April 28, 1909, the serial number of the application being 492,665. His claims were so like Gulick's that the patent office declared an interference. The gist of the finding handed down by the court of appeals is that the decision of the commissioner of patents shows that the invention belonged to Gulick and not to Russell Huff. The Packard company claims it has not used this type of construction for some time.

Republic vs. Morgan & Wright

Final hearing of the suit of the Republic Rubber Company against Morgan & Wright has been advanced to the current calendar of the United States Circuit Court of Appeals and may be called at any time.

This case involves the validity and infringement of the Mell patent covering the staggered tread of the complaining company's line. In the United States District Court the Republic contention was sustained and the present hearing is on appeal from that decision.

The Sager suit against Emil Grossman is on the equity calendar of the United States District Court and will probably be reached Thursday.

Against Interstate Commerce Rules

WASHINGTON, D. C., March 25.—The Interstate Commerce Commission, in a recent ruling, holds that the movement of a gasoline motor car from the manufacturer to the purchaser over the rails of a common carrier is transportation that is subject to the act, when between interstate points, notwithstanding the fact that it moves under its own power and is operated by employees of the manufacturer. Such transportation is lawful only when a rate for it has been duly published.

Except on the commodities specifically enumerated in section 1 of the Act, rates cannot lawfully include the passage of attendants, and as gasoline cars are not so enumerated the attendants must pay fares on the basis of the regularly published passenger fare then in effect. In adjusting its rates, the carrier should take into consideration the conditions surrounding the movement of traffic of this kind.

Colby Decides to Go It Alone

MASON CITY, IA., March 25—The negotiations between the Colby Motor Company and the Western Implement & Motor Company for the combination of the two concerns have by mutual consent been abandoned.

Complain of Poor Service

New Cadillac Factory May Go Up Elsewhere Unless Detroit is Given Better Freight Facilities

Fall River Dealers Also Complain—Detroiters Looking Over Findlay Plant

DETROIT, MICH., March 25—Thomas Neal, president of General Motors Company, declares that unless the railroads entering Detroit show a great improvement in their freight service in the near future the Cadillac Motor Car Company, one of the largest and most important of the General Motors group of plants, will choose some other city as a location for a large additional plant the company is about to build.

"The Cadillac Company is affected in two ways," said Mr. Neal. "First, its officials are now confronted with the fact that they cannot get materials en route with which to keep the plant going, and if the situation is not relieved at once production must necessarily be curtailed; second, they are not receiving from the railroad companies enough cars to ship their finished product with the result that they have accumulated more finished automobiles than they have capacity to store and as a consequence are again stalled. Because the present plant is adequate to take care of only the present demand we have in mind an extension to the plant. In view of the fact that the railroads entering Detroit have proven themselves unable to care for the present needs of the manufacturing interests our board of directors naturally hesitates before expending a million dollars in a plant here only to find when they were ready to ship their product they had no means of shipping it.

"There is only one answer: Erect the plant in some city outside of Michigan, where adequate shipping facilities could be had. What particular cities we have in mind we are not prepared to discuss, but there are a number of points under consideration in Ohio, Indiana and Illinois."

Want Better Rail Facilities

FALL RIVER, MASS., March 24.—The automobile dealers here have filed a protest with the railroad company against the facilities given them for removing their cars from trains. The company simply provides a couple of narrow planks and the dealers have to do all the heavy work. Under the present conditions it is difficult and dangerous work to get the cars out of the freight cars. It is claimed that it now takes about 15 men half a day to get a car out of the freight yards and this costs about \$50. With proper facilities the work could be done by a couple of men in half an hour. Since January 1 more than \$150,000 worth of cars have been unloaded this way. A slight deviation from the skids would cause a machine to topple over and be badly damaged and also hurt those working about it.

Richmond Dealers Form Association

RICHMOND, VA., March 25—For the purpose of protecting and promoting the interests of members and purchasers of automobiles and accessories, the Richmond Automobile Dealers' Association was formed on the night of the 22nd, with the following officers: L. M. Foster, president; Joseph F. Leonard, vice-president; D. W. Richards, treasurer. The office of secretary will be filled later.

A meeting will be held on April 5 at which time by-laws and constitution will be adopted. The steering committee, composed of R. B. Allport, Shannon G. Lee and C. S. Clarke, reported with the recommendation that the constitution and by-laws of the Philadelphia Automobile Trades Association be adopted.

The board of directors is composed of L. A. Folger, R. B. Allport, Mark R. Lloyd and Nixon Ball. These, together with the officers, will name the secretary, who will be a salaried officer.

C. S. Clarke was named chairman of the committee on admissions with the power to name his own committee of four members.

Detroiters Inspect Findlay Plant

FINDLAY, O., March 23—Several capitalists representing established Detroit automobile factories have visited Findlay within the past few weeks looking over the Findlay Motor Company plant, which is now in the hands of trustee, John M. Barr. This condition has existed for 6 months. The plant is well equipped, and was organized and put into running condition by L. E. Ewing, who came here from Cleveland. He interested local capital to the extent of more than \$100,000.

Cleveland creditors of the concern are reported as being concerned over the long shut-down, and, it is intimated, may ask that the company be declared an involuntary bankrupt.

To Test St. Paul Taxi Meters

ST. PAUL, MINN., March 25.—An ordinance which is being prepared for testing of taximeters by W. M. Peterson, St. Paul city sealer, provides that the meter on each cab is to be tested by removal from the car and attachment to a tester. The measurement of the cab wheels and tires will then be taken and the cab run over a measured course with meter attached. If the correct fare is shown the meter will be approved and sealed against tampering. Another provision is that a passenger may refuse to pay for any part of the ride should the cab break down, unless he waits for the cab to be repaired.

Extending Montreal 'Bus Line

MONTREAL, March 23—So successful has the venture of the Montreal Autobus Company been in introducing the first motor-driven omnibuses to the streets of Montreal that the company now proposes placing thirty more 'buses on the streets by the first of May and establishing other 'bus routes.

One line will be operated between Victoria avenue, Westmount and Place D'Armes square. The 'buses will run from Place D'Armes Square to Victoria Square, up Bleury street to

U. S. Motors' New Supervisors

In the extension of its selling organization the United States Motor Company has added three new supervisors, whose duties involve the supervision of the branch houses and dealers in different parts of the country. Ernest H. Brandt will have charge of the New York District, including the branches and dealers under them operated at New York, Albany, Syracuse and Buffalo, with offices at New York. Fred A. Harris will care for the Middle District, having in charge the branches at Chicago, South Bend, New Castle, Indianapolis and St. Louis, with headquarters in Chicago. S. D. Porter is appointed for the Western District, including the branches at Minneapolis, Kansas City, Des Moines, Omaha and Dallas, with headquarters at Kansas City.

Taxicab Company Buys Out Rival

Stockholders of the New York Transportation Company called in special meeting Monday ratified the proposal to sell the taxicabs, garage, machine shop and good will of the company to the Connecticut Taxicab Company, of New York. The exact terms of the sale were not announced, but it is stated that the transfer will be consummated before June 1. The announcement of the project to sell was made exclusively in these columns. The Fifth avenue 'bus line is not included in the sale.

Dorchester, and then westward to Victoria avenue. A second line is to be operated along Sherbrooke street between Victoria avenue and Park Lafontaine. Other lines are to be operated on Park avenue and St. Denis street.

The new Vinot buses are to be twice as large as the ones now being run, and will seat thirty people instead of twelve, as do the ones at present in use, the capacity of the latter having been found inadequate.

Truck Company in Its New Plant

GRAND RAPIDS, MICH., March 25.—The Grand Rapids Motor Truck Company is now settled in its new plant. The following officers and directors have been chosen: President and general manager, M. E. Brackett; vice-president, E. A. Clements; secretary and treasurer, Frank T. Hulswit; directors, Carrol F. Sweet, E. A. Clements, H. L. Adzit, F. T. Hulswit, W. F. McKnight and John W. Blodgett, of Grand Rapids, and M. E. Brackett, of Decatur, Ind.; W. J. Vesey, of Fort Wayne, Ind., and John L. Taylor, of Boston. To facilitate the organization of the company \$100,000 worth of stock has been underwritten by Grand Rapids men. This is preferred stock and will be offered for sale at par.

Preparing Ohio's Canadian Plant

CINCINNATI, OHIO, March 25.—By a deal just completed with the Board of Trade of Colborne, Ont., the Ohio Motor Car Company of Cincinnati will locate its Canadian plant at Colborne, which is situated on Lake Ontario, 84 miles east of Toronto. A committee from the board of trade of Colborne visited the big Ohio factory the fore part of the present week, at which time the deal for the building of the plant was completed. The Canadian company will be incorporated with \$400,000 capital. \$250,000 will be common stock and \$150,000 preferred. While the Canadian company manufacturing the Ohio car will locate their plant at Colborne, the general offices for the Dominion of Canada will be located in Toronto. Chas. F. Pratt, president and general manager of the Ohio Motor Car Company of Cincinnati, will continue as active head of the parent concern and will also have an active part in the management of the Canadian company. Work on the new factory will be started at once, the plans for the new building having already been examined and officially approved.

Johnson to Continue Trucks

It has been announced by the New York representative of the Johnson Service Company, of Milwaukee, Wis., that the concern will continue the manufacture of commercial vehicles, but that it will retire from the pleasure car field. The statement was made in THE AUTOMOBILE of last week that the company had decided to discontinue the making of automobiles, owing to the death of Professor Warren S. Johnson.

To Build Electrics in Buffalo

BUFFALO, N. Y., March 27.—During the past week the Buffalo Electric Vehicle Company filed papers of incorporation at Albany with Secretary of State Lazansky. The directors named in the papers are Buffalonians, including William J. P. Seipp, W. C. Feuchter, Thomas R. Wheeler, Frank G. Lane and Marcus A. Alexander. John W. Van Allen, of the firm of Wilcox, Pull & Van Allen, Buffalo, is counsel for the new concern.

In the incorporation papers the capital of the new company is given as \$1,000,000, of which \$700,000 is common stock and \$300,000 preferred. The concern is to manufacture electric pleasure and commercial motor cars. It was rumored among local automobile dealers that this new concern is a merger of five or six Buffalo motor companies, but this is denied by Attorney Van Allen.

Consolidated's Good Report

Net Earnings of \$114,020 for Year— Crude Rubber Reaches New High Mark—Ohio in Canada

Bosch May Leave Springfield—Grand Rapids Truck Company in Its New Plant

AKRON, O., March 25.—The Consolidated Rubber Tire Company, makers of Kelly-Springfield tires, had net earnings of \$114,020 for the year ending December 31, 1911, according to a report recently made. This was an increase of \$28,505 over the previous year. The gross sales for 1911 were \$3,383,532, as against \$2,160,915 for 1910.

The income account for the two years is shown by comparison as follows:

	1911	1910
Gross sales	\$3,383,532	\$2,160,915
Interest, diva. rec.	95,562	150,402
Total receipts	\$3,479,094	\$2,311,317
Expenses, taxes, etc.	3,365,074	2,225,802
Net earnings	\$114,020	\$85,515

New High Mark for Crude Rubber

Covering by shorts in the London market for crude rubber was reflected on Monday in the New York trading and price levels were raised to new high marks. The closing figures were \$1.23 to \$1.24 a pound, based on fine up-river. The technical position of the market is very strong and stop-loss buying orders were caught in increasing volume clear to the close.

Starter Company to Incorporate

DETROIT, MICH., March 25.—Articles will be filed in a few days with the Secretary of State at Lansing, increasing the capital stock of the Invincible Starter Company to \$25,000. The new officers of the company are: Edward J. Corbett, president; D. W. Reinohl, vice-president; George S. Anderson, treasurer, and H. J. Weeks, secretary and general manager. The directors are Edward J. Corbett, D. W. Reinohl, Walter E. Oxtoby and George F. Monaghan.

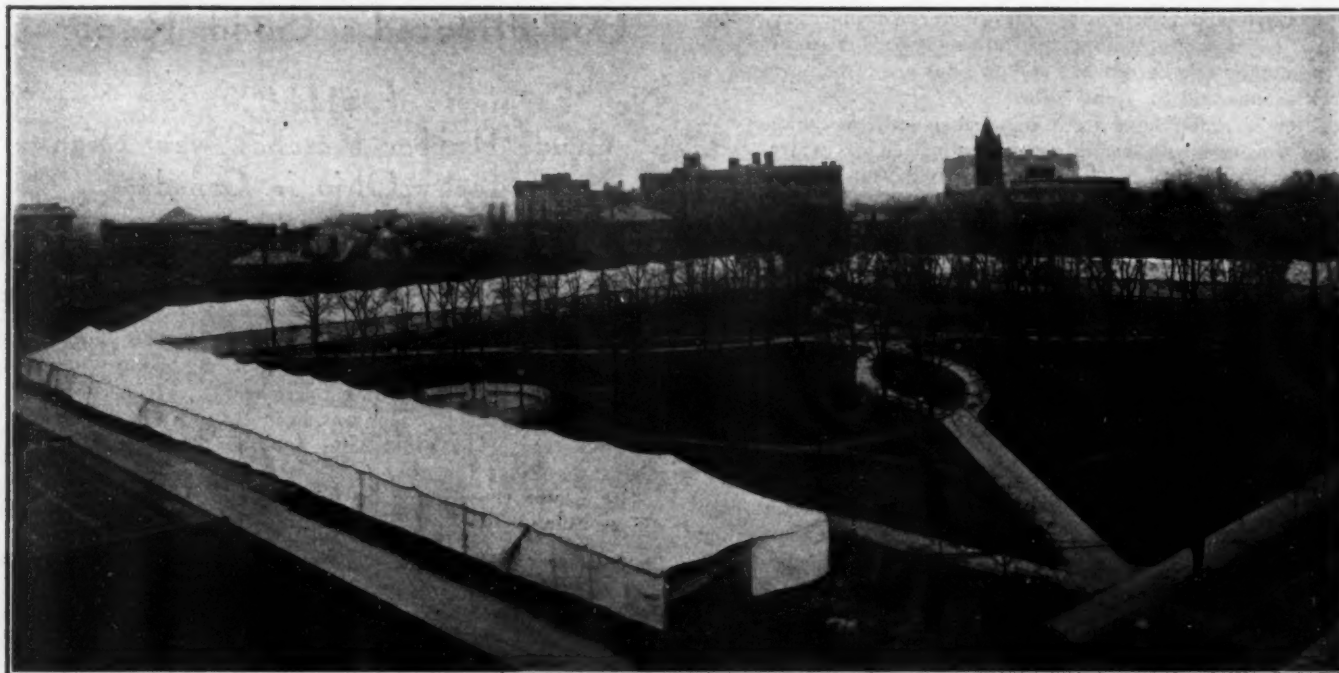
The company is engaged in manufacturing the Invincible acetylene gas starter for automobiles and motor boats.

Bosch May Move to Bloomfield

SPRINGFIELD, MASS., March 24.—There is a possibility that the Bosch Magneto Company may move its plant to Bloomfield, N. J., and purchase the plant of the Simms Magneto Company. Charles M. Wild, general superintendent of the company, has inspected the Simms plant and has advised that it be purchased. President Otto Heins, of the Bosch Company, is dissatisfied with the action of the state board of health that was recently petitioned to have the Springfield Rendering and Provision Companies moved from Brightwood, and this has something to do with the contemplated move to New Jersey. The Bosch Company will sell its plant here and leave the city if the deal goes through.

Wilmington Adds Service Wagons

WILMINGTON, DEL., March 18.—Two new municipal motor cars were added to the equipment of the city of Wilmington today, both Ford runabouts. One went to the Department of Parks, for the use of Superintendent Edward R. Mack, in going over the park system, as he has to do almost daily and cannot do in any other way. The other went to the Water Department.



Huge tent extending around three sides of a square in which Indianapolis Show is being held

Indianapolis Tent Show Opens

Novel Exhibition Stunt is Drawing Big Crowds in the Indiana Metropolis—Series of Shows in New York State

INDIANAPOLIS, IND., March 25—A novelty in motor exhibition is being held here under the auspices of the Indianapolis Automobile Trade Association, which is holding a show under canvas. It might be said that the association is not holding the show in the open because it particularly favors that kind of an exhibit, but because there is no building in the city of sufficient capacity to give a complete exhibit under one roof.

The exhibition was opened at 1 o'clock last Saturday afternoon, when Mayor Samuel L. Shank pulled a rope that hoisted a banner on top of the tent, reading "Why Indianapolis Needs a Coliseum."

This is the first time local tradesmen have ever had a show all under one roof. For several years each concern has exhibited in its own place of business, while all of the dealers and manufacturers have usually united in a parade and other outdoor events. This arrangement, however, has not brought results.

But the tent seems to have solved the local question in a very satisfactory manner. The city authorities gave permission to block New York, Vermont and Meridian streets, around three sides of University Park, and it is here that the tent has been erected. The posters say it is the largest tent ever constructed, and while this statement may be liberal, the tent is nevertheless a mammoth affair.

The tent is approximately 1300 feet long and fifty feet wide, providing 65,000 square feet of space. There is an aisle through the center, with exhibiting space on either side. The exhibits take up 48,000 square feet of space and additional space could have been sold, had it been available. There are forty exhibitors of cars, twenty-six of accessories and supplies and six of motorcycles.

Each exhibitor has from 150 square feet to 1800 square feet of space and the exhibitors of cars are showing from one to twelve models each.

The show has been advertised extensively throughout Indiana. Those in charge of the show are predicting an attendance of 100,000 during the week. In view of the fact that this is the distributing center for Indiana and in some instances for neighboring states, hundreds of dealers are expected to attend, and it is believed many agency contracts and sales will be closed.

The show closes Saturday night. John Orman is show manager, and the executive committee in charge of the show consists of Harry L. Archey, chairman; Frank Staley, Ellis Hunter, Frank L. Moore, George A. Weidley, R. H. Losey and H. H. Rice.

The net proceeds are to be held in trust and eventually turned over to aid any definite movement for providing a coliseum for the city.

Shows in Northern New York

SYRACUSE, N. Y., March 23—The 1912 automobile show cost the Syracuse Automobile Dealers' Association \$10,000. While the cost of staging the show was greater than last year, the receipts were just doubled and the association will be able to declare a good dividend. Next year the exhibition will be held under one roof, using all available space in the infantry and cavalry armories. A flooring will be placed over the tanbark in Troop D's drill hall, and as this is the same size as the infantry armory used this year there will be more exhibit space than was possible this year, even with the use of the Alhambra.

The show at Watertown was opened last Tuesday to continue through the rest of the week. It is the third annual exhibition under the direction of the Watertown Association and it is drawing thousands from Syracuse, Utica and thence northward. Forty-five cars are shown, representing thirty-five exhibitors. There is a big display of accessories.

Another big automobile show for northern New York will be that at Oswego, opening April 20. It will be quite as large as the Watertown show. W. R. Marshall, of this city, manager of the big Syracuse show, is also in charge of the Oswego exhibition, and in fact promoted it. The show will be held in the Armory.

Fifty cars, representing thirty manufacturers, will be shown at the first annual automobile show of Geneva, opening March 28 and continuing three days. The Automobile Club of Geneva and The Chamber of Commerce are uniting in the project.

Denver Show Breaks Records

Both in Attendance and Sales it Excels
All Previous Efforts—Continental
Gasoline-Electric a Feature

DENVER, COL., March 23—The eleventh annual Denver Auto Show closed last Saturday after having broken all previous records for attendance and sales. That Denver is rapidly assuming its place as the motor center of the entire West was shown by the geographical distribution of the registered visitors. Names from Phoenix, Ariz.; Salt Lake City, Utah; Portland, Ore., South Dakota and Texas were noted.

Dealers do not report large sales as a direct result of the show, but there are only a few who do not feel that it was a worthwhile enterprise and a stimulus to motor trade in general which will be felt in the season that is now opening. Most of the local agents landed one or more sales as a direct result of their being on the floor and are satisfied with their share of the business for the week. All report that they have large lists of live prospects and that the motor trade will be lively here this spring.

The exclusive feature of the Denver show which appeared nowhere else in the country was the new Continental truck, which is being promoted here now by the Continental Motor Truck Company. It is a gasoline-electric drive of a unique design and was planned by R. S. McKeage. It presents some features which have not been generally adopted by American truck manufacturers, but which experience of European truck experts has shown practicable. The power for the dynamo is generated by a Continental four-cylinder gasoline engine. The dynamo is a Westinghouse Model C of 125 volts. The power is delivered to the wheels through two Westinghouse motors of 110 volts and double roller chains. All chains are covered with dust-proof aluminum covers and run in oil. The wheels are steel and fitted

with Goodrich solid-base tires. The front tires are 36 by 4-inch single and the rear are 38 by 4-inch double.

The Ross patent steering gear is used and internal expanding brakes of 16 1-2 by 4 inches surface. The frame is of 5-inch channel section steel. The capacity of the present model is 3 tons. The wheelbase is 142 inches, the tread 58. The truck is fitted with a Westinghouse continuous torque controller, which has three positions. The first position is for heavy torque and hard pulling and the motors are in series; in the second position the motors are in parallel for higher speeds under ordinary conditions; in the third series the motors are connected in parallel with commutated fields which permits rapid running without load. The speed, loaded, varies between 7 and 10 miles per hour, while the empty truck can attain a speed of 12 to 15 miles per hour.

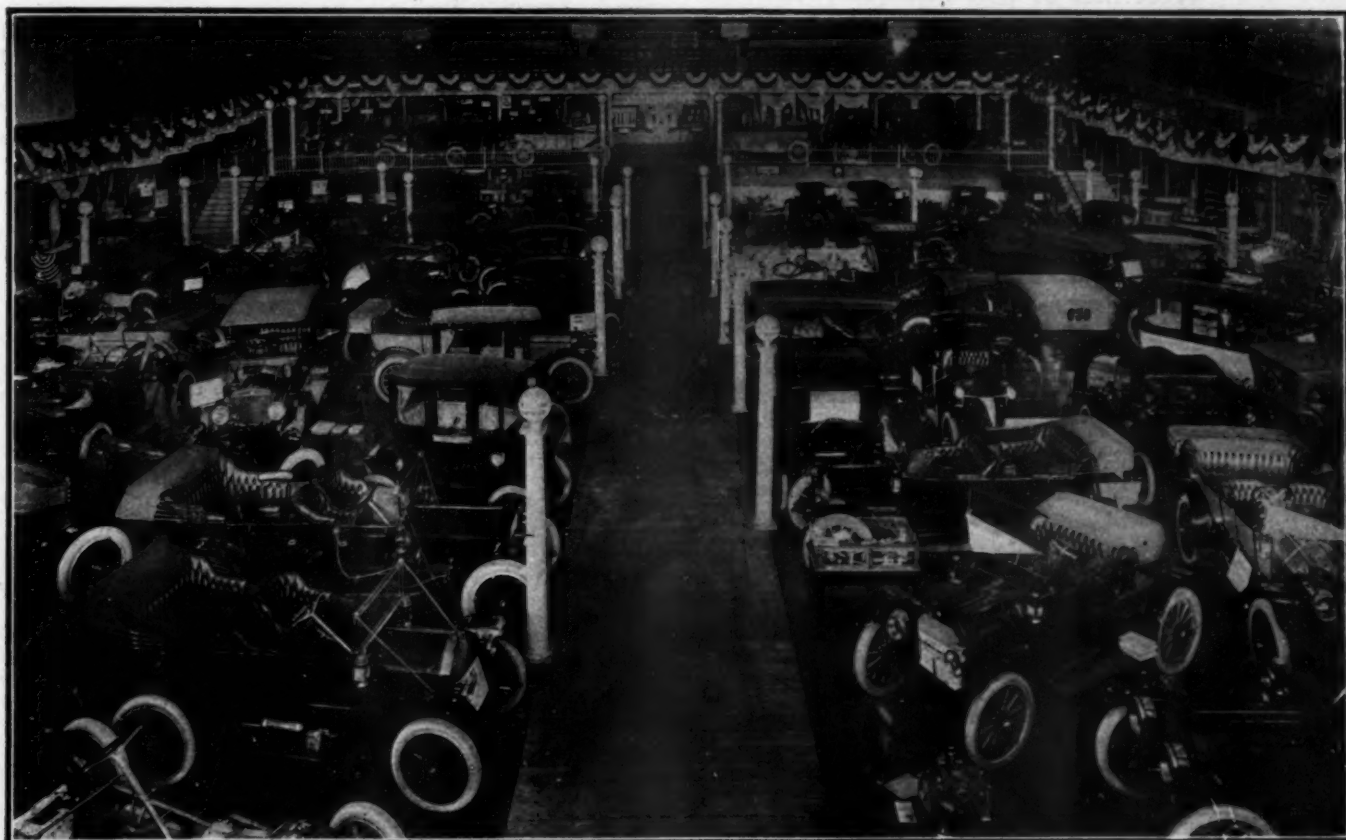
The officers of the Continental company are W. S. Copeland, president; Charles Kirk, vice-president, and J. F. Gunthorpe, secretary and treasurer

Toronto's Next Motor Show

TORONTO, CAN., March 25—Inquiry in motor trade circles points to a much larger showing than ever before at the Canadian National Exhibition, to be held here about the first of September, lasting 2 weeks. It is safe to say that most of the local dealers will be represented by one or more cars, and space will be required for nearly, or quite, 100 cars. This exhibition attracted more than three-quarters of a million persons last year.

Goodrich Capital Increase Adopted

AKRON, O., March 27—The plan to increase capital stock of the Goodrich Company to \$45,000,000 went through at a meeting of stockholders here this afternoon. The plan was unanimously adopted by all of the representation of the stock present, 98½ per cent. of common stock and 95½ per cent. of preferred. It is said that one-third of the preferred stock will be retired for three years and will not pay more than 125 when it is taken off the market.



General view of the Denver Show, held in the Municipal Auditorium—Looking west on main aisle

New Jersey Secedes from Union

Garden State Senators Refuse to Act Favorably on Stickle Reciprocity Measure for Automobilists

Bill Introduced By Senator Gaunt, Leader of Opposition, May Become Law

TRENTON, N. J., March 25—Almost in the shadow of the blood-stained and bullet-torn banners which were borne by the New Jersey regiments in the great war which was fought to prove that no state or states could withdraw from the Union, New Jersey seceded from the Union to-day. The learned Senate was the prime mover for secession and the responsibility lies with each and all of the eleven members who refused to obey the constitution of the United States, party pledges upon which they were elected and common sense, by opposing the passage of a measure that would give free rights of entry to the state by automobiles as well as horse-drawn vehicles, railroads, equestrians and pedestrians. The Stickle Bill, passed by the House of Assembly by an overwhelming majority, is doomed to die, despite the constitution and pledges solemnly entered and adopted by both Republicans and Democrats to enact a law to do even-handed justice to all classes of transportation.

A more pitiful exhibition of bigotry and ignorance was never displayed by a senior legislative body of any American state. Wanton disregard of platform pledges and idiotic worship of a phantom superstition were the causes of the blockade of justice. Of course, there were a few opponents of the measure who acted up to their lights and over-rode the platform instructions upon which they were elected, in a mistaken sense of duty. That, naturally reflects only discredit upon the clear-sightedness of their constituencies and can be remedied at the next election.

Went Back on their Platforms

The reasonable bill is dead as a herring and in all likelihood some substitute measure—probably Senate Bill 70, introduced by Senator Gaunt, will be put through in the final minutes of the session.

An illuminating feature of the situation may be found in the planks of the party platforms upon which the legislators went before the people at the last election. These read as follows:

The Democratic pledge:

"We favor the enactment of laws with regard to the use of automobiles within the state which will grant the same rights and privileges to the owners and drivers of machines from other states that are accorded the citizens of this state in the states from which said owners and drivers hold their licenses and which will tend to establish a proper reciprocity of responsibility as between the license-granting authorities of the several states."

A number of Democratic Senators voted against the Stickle measure despite the above declaration.

The Republican plank was shorter:

"We reiterate our declaration for such legislation with respect to automobiles as shall be just to the automobilist and taxpayer alike and shall properly promote reciprocal relations between this and other states for the use of their respective highways by non-resident automobilists."

A Republican majority against the Stickle measure has stood like a stone wall against its passage.

The main difficulty experienced in the course of this legislation has been that the solons would not consent to eliminating the provision of the existing law which requires non-residents to sign a power of attorney constituting one of the state officials the legal representative of the visitor to receive service in case of any infraction of the law on the part of the visitor.

In their wisdom, the senators who have opposed reasonable

legislation say that reciprocity can be had despite the power of attorney clause. They do not take into account the fact that no other state will even commence negotiations unless that particular feature is eliminated. Jersey might figure for reciprocity on that basis, but it would be like playing solitaire, somewhat one-sided.

The fault found with the power of attorney clause, outside of Jersey, is that, under it, the visitor surrenders a constitutional right and by surrendering, admits the legality of the automobile law. This tends to imperil the standing of all other constitutional safeguards.

The Senate is strong for the power of attorney, the gist of the argument presented being that if it is abolished, the state will have no hold on law-breaking automobilists. It was called to the attention of several of the Senators today that the clause is useless, inoperative and a gratuitous slap at visitors.

The following conversation between a staff member of THE AUTOMOBILE and Senator Gaunt tells the story:

THE AUTOMOBILE: "Senator, suppose after registration and compliance with the present law, signing of the power of attorney and all the rest of the formalities, an accident happens and the visiting car is stopped. Does the fact that the owner signed a power of attorney help the New Jersey authorities to bring the offender to justice?"

Senator Gaunt: "No, not in that case."

Refused to Stand by Pledges

THE AUTOMOBILE: "Well, Senator, suppose the visitor speeds away and his identification number is not seen; will the power of attorney help any?"

Senator Gaunt: "No, the state officials would have to take a chance just the same as if the automobilist were a Jerseyman."

THE AUTOMOBILE: "Then, Senator, why are you in favor of insulting the visitors and prospective visitors by forcing them to acknowledge themselves to be of suspected antecedents, like pickpockets and such, if the insult serves no valuable purpose to the state?"

Senator Gaunt: "This conversation has proceeded far enough along that line."

Senator Barber, another consistent opponent of the Stickle bill, was asked why he had failed to regard his party pledge and replied: "Personally, I am in favor of reciprocity. You can say nothing more that could make my personal attitude more favorable to the measure. I believe in it, but—my county does not."

The fact that he had gone before his county pledged to advocate reciprocity and was elected on that platform, did not alter Senator Barber's views. All of which might cast some doubt as to the correctness of the Senator's estimate of his own opinion.

Senator Gaunt has a bill pending in the Senate which represents the feeling of a certain faction in the legislature. This bill in brief is a supplement to the existing law and provides:

Free entry to the state for 15 days a year; providing the visitor makes application, describing his car and identifying it and specifying what days he will use it within the state. Also he shall sign a power of attorney constituting the secretary of the State Highway Commission his legal representative to accept service in his name and behalf in any action or legal proceeding necessitated by the operation of the visiting car. All automobile fees and licenses are raised in price and seven classes are marked out, ranging from \$2 for motorcycles and small cars to \$40 for cars of over 50-horsepower. Coupled with the horsepower classes are a series of allowed weights, including the vehicle itself, ranging from 1,000 pounds to 6,500 pounds. Trucks and commercial vehicles are completely overlooked.

The reciprocal feature is a wonder. Under section 4, the Gaunt bill provides: "The State Highway Commission is hereby authorized and empowered to enter into reciprocal arrangements with the Highway Commission or other body of any other state having charge of the regulation of motor vehicle traffic and of the issuing of motor vehicle licenses, for the purpose of provid-

ing a uniform and interchangeable system of registration and of identification; provided, however, such an arrangement shall not conflict with any existing law regarding the registration fees to be charged automobilists running on the highways in this state, nor any method of identification be adopted which in the opinion of the State Commission shall less efficiently identify motor vehicles than do the methods now in use. The Commission shall, however, have power under such circumstances to adopt such identification devices or supplementary identification devices as may be desirable or necessary either for more effectively identifying motor vehicles or to provide more convenient and easily adjusted devices than are now in use."

Strange to say, Senator Gaunt is the owner of an automobile, a Haynes, and takes a pardonable pride in the fact that he has driven 16,000 miles and boasts that he got 8,000 miles from a single set of tires.

He was asked about touring outside New Jersey and replied that so far he had not attempted to do so. His position on reciprocity is that it would be unfair to New Jersey because while the Pennsylvania motorists might enjoy the Jersey roads, the Jerseyman could not enjoy the Pennsylvania roads because in addition to being poor, they were afflicted with relics of bygone days in the shape of toll-gates.

Disappointment Among Automobilists

It was shown that the automobilists of Pennsylvania had accomplished much toward wiping out the toll-road evil and were going to do much more. It was also shown that even if no work had been done and none were in prospect, still the New Jersey automobilist touring in Pennsylvania stood in no better position as far as touring is concerned than the man who clings to horses, in case reciprocity was granted.

The horse driver would have to pay tolls, if there were toll-roads, precisely the same as the automobilist.

Conversely, the Jersey horse driver will profit by the efforts of the Pennsylvania motorist in case the Chinese wall against automobiles is maintained after the toll-roads are abolished.

The automobilists of New Jersey are much disappointed over the killing of a reciprocal enactment and the general attitude at present is that if the power of attorney clause must remain, thus barring New Jersey from reciprocal negotiation with other states, it might as well be through the passage of such a measure as that advocated by Senator Gaunt.

They figure that such a measure must bring relief quickly through the intervention of the United States Supreme Court as a reaction from its unconstitutional strictures.

The procedure suggested is to have some automobilist test the law after passage, carrying it through the United States District Court to the Supreme Court on the single constitutional point raised as to the right of any citizen to free entry into any of the states.

A decision of that sort would form the foundation stone for Federal legislation that would wipe clean from the statute books of every state in the union, every vestige of sumptuary legislation as it affects the interstate use of the automobile.

Senate Vainly Backs and Fills

TRENTON, N. J., March 26—The axe has not officially fallen upon the automobile reciprocity bill. Although it was fully expected that another vote would be taken on the measure today, it was found at the last minute that one vote was lacking to make the eleven necessary to insure its passage.

Senator Austen Colgate, of Essex, who is fathering the bill, found today that he had but ten votes. Two were gained since the vote on the bill last week. It is now almost certain that Senators Price and Barber, both Democrats, will vote for the bill and everything possible is being done to bring Senator Read, Republican, around to the "right" side.

It is rather a peculiar situation that although Senator Colgate and Majority Leader Walter E. Edge, both favor the bill, there

Willys Secures Gramm Plant To Continue Truck-Making at Lima, O., Establishment, Marketing Output Through Overland Dealers

**Employs 1,200 Men—Buildings Are of Steel and Concrete
and Valued at \$1,250,000**

TOLEDO, O., March 27—It was announced yesterday that John N. Willys, president of the Willys-Overland plant, had bought the controlling interest in the Gramm Motor Truck Company, of Lima, Ohio.

For some time Mr. Willys, realizing the enormous development in the truck field, and the impracticability of combining the pleasure and commercial ends of the business, had determined on a method of truck production that would parallel his pleasure car production. B. A. Gramm will have charge of the commercial car end of the business.

The Gramm plant will thus have an immediate outlet for its entire output through the Overland dealers, which number over 2,000. It is the largest truck plant in the world, and occupies 22 acres of ground. There are 6 1-4 acres under roof, and 1,200 men are employed. The buildings are of steel and reinforced concrete and are valued at \$1,250,000.

are only two other Republicans who are lined up with them. Both Mr. Edge and Col. Colgate are trying to impress upon the minds of their colleagues that reciprocity as provided for in the Stickle bill was one of the platform pledges of the Republican party and ought to be passed at this session of the Legislature.

Senator Isaac T. Nichols, of Cumberland, is between the devil and the deep blue sea on the subject. He would like to vote for it to please Atlantic City, but the other parts of the congressional district in which he lives, and which he hopes to represent in Washington, are said to be opposed to reciprocity.

This afternoon a delegation of motorists representing sixteen organizations in the state waited on Colonel Colgate and urged him to continue his efforts in behalf of the measure he has so persistently advocated.

There are but a few days left in which the bill may be brought up. The Legislature expects to adjourn this week and it is certain that before doing so a bill of some kind will have to be passed if the Republicans are to go before the people next fall and say that all of their platform pledges have been carried out.

The reason no action was taken today is explained by the fact that Senator Read, the only person who is in the doubtful column has not agreed to change his mind.

Despite the attitude taken by Mr. Read, Senators Colgate and Edge have not given up hope. They are still working on Senator Nichols and think that they may induce Senator Hand, of Cape May, to change his mind.

Every possible means was taken by those favoring the bill to get the sufficient number of votes. Bargains were struck whereby the outstanding senator was insured that his favorite bill would pass despite previous opposition, if he voted for reciprocity. Just when it was thought that everything was well, the powers that be behind the throne called off the particular man.

Some of the senators were for passing any apology for a reciprocity bill but others declared that rather than pass one that would prove useless they are satisfied to let the things go until next year.

At the present time the Senate is lined up as follows: In favor of the bill are: Colgate, Edge, Fielder, Johnson, Low, Pierce, Prince, Slocum, Price and Barber.

Opposed: Gaunt, Gebhardt, Hand, Leavitt, Lewis, Nichols, Read, Silzer and Smalley.

Cleveland Engineers Meet

Devote the Entire Session to Subjects Connected With Automobiles and Motors

CLEVELAND, OHIO, March 26—At the meeting of the Cleveland Engineering Society tonight, the evening was devoted to illustrated lectures on the automobile motor. The subjects were "The Long-Stroke Motor," by J. B. Entz, engineer of the White company; "Valve Mechanisms," by James G. Sterling, engineer of the Stearns company, and "Motor Starting Devices," by H. B. Anderson, engineer of the Winton company. Although the audience was composed principally of engineers, the discussions were somewhat elementary, as the hearers were most of them in other lines than that of the motor industry. In discussing motor starting devices, H. B. Anderson divided the starters in a rather novel way. He classified them under kinetic and potential starters. He said in part:

"Kinetic devices owe their development to engineers, while those of the potential type principally owe their existence to the fact that the addition of water to calcium carbide forms acetylene gas. Kinetic starters by diverse means produce rotation of the crankshaft, depending upon the motor functions to succeed such action; in other words, assuming that a proper mixture will enter the cylinder and be ignited. Such mechanisms are cranking devices and not starters.

Essentials in Motor Starting

Potential starters depend upon having or placing in the cylinders a combustible mixture of some hydrocarbon and air; and, to use the accepted term, start on the spark. They are priming devices only and depend upon ignition to start. Starting a motor assumes three things as essential—rotation of the crankshaft, carburetion proper, and ignition of the charge. Eliminating any one element precludes a started motor, and for that reason it is asserted that this classification of cranking devices and priming devices is correct.

"Starting devices have taken such a prominent position, that one is almost inclined to think them a matter of recent development. As long ago as 1899, stationary engines were equipped with a hand-pump to force a charge into the cylinder, which was exploded by striking a rod which ignited a match in the cylinder. Charter in 1892 patented a hand-operated pump and carburetor for starting. Ignition of gunpowder by an electric spark was patented in 1899, and a cartridge was used by the Wolseley com-

pany in England in 1904. A spring starter is recorded in the patent office in 1900.

"At the Paris Salon in 1905, there were several so-called self-starters displayed. The Societe Mors exhibited one consisting of a hand-pump which in operation forces a gasoline mixture into the cylinders and afterwards starting on the spark. Cormilleau and St. Beuve displayed a ratchet connected clutch pedal which at each operation turned the motor a little. De Dietrich equipped with the Le Tombe device, which consisted of a small air compressor, which charged a tank and on its shaft had a distributor valve synchronized with the motor.

"Renault had a rack and pinion two-cylinder pump starter, called the Cyanogene, operated by a carbonic acid tank. Henry Piper displayed a gasoline-electric vehicle with a storage battery, which also accomplished the starting electrically. At the Chicago show in 1908, the Harrison car exhibited a device for

French Ford Agents to Fight

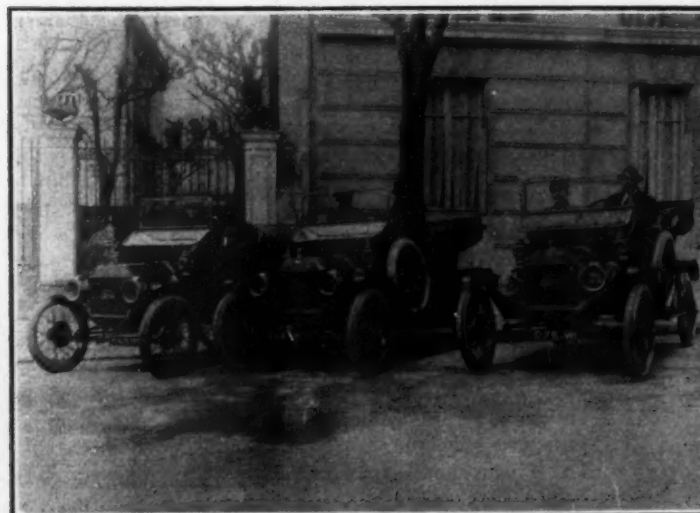
Say Management of Tour de France Favors the Foreign Competitors

PARIS, March 14.—Henri Depasse, the French agent of the Ford company, has thrown his hat in the ring. His special object is to get the promoters of the Tour de France in a position where he can get some satisfaction from them. M. Depasse entered a team of three Ford cars for the 3000-mile run around France, and in place of the standard wood wheels equipped them with a set of detachable wire wheels. This change also was made to the two Reo cars entered in the competition.

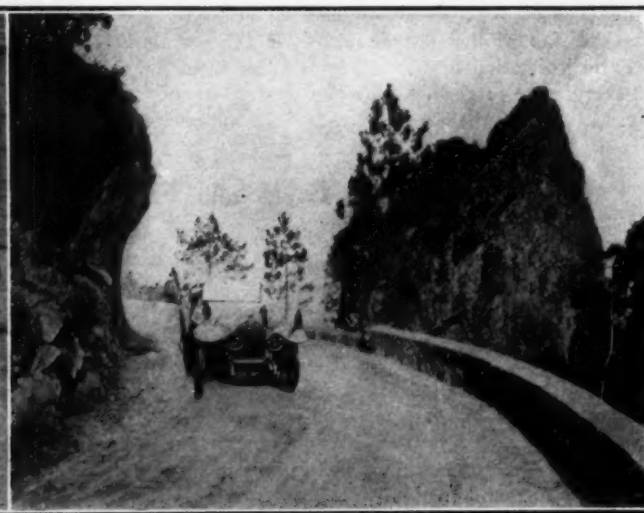
When the mountainous stage of the journey, from Grenoble to Nice, was reached, the Ford cars had their rear wheels replaced by others of smaller diameter, to get advantage of a lower gear ratio. There is nothing in the rules governing this point, and the contention of Depasse was that anything which was not forbidden was allowed. The other competitors, however, did not see it in the same light, with the result that protests flowed in and the jury finally disqualified the entire Ford team.

Depasse, however, refused to take his entry out, and tested the right of the jury to disqualify him. The three Fords were ordered to continue to follow the route unofficially. At the same time Depasse undertook a publicity campaign against the organizers, in which he accused them of having ruled him out because they were afraid of him.

It is worth nothing just here that the Ford is one of the few



Ford team disqualified by the Tour de France officials



One of the Benz team, which is followed by a supply car

starting on the spark after previously admitting acetylene into the cylinders. The foregoing indicates that the general idea involved in all the present starters is old.

"Until the six-cylinder motor was in use, an air starter was impractical, inasmuch as in that type, where the engine piston received the air pressure, the air must be admitted on the firing stroke and as the exhaust valve opened approximately 45 degrees previous to the stroke completion, the flywheel could not carry the motor the other 45 degrees. The main difficulty was that at the time the air was cut off, another cylinder was reaching its maximum of compression. Chalmers for this reason provided a relief port in the air distributing valve so as to communicate the cylinder under compression to the atmosphere. With a six-cylinder motor where ignition and other functions succeeded each other every 120 degrees, we find that it is possible to have air pressure upon two cylinders at one time which as-

Disqualified Without Reason

Nothing in Rules to Cover Alleged Offense Charged Against Team

teams having covered two-thirds of the course without the loss of a single point. This brought forth a further protest on the part of the other competitors, who declared that the decision of the jury was an equitable one and that the publicity of the Ford agent was an attack on the honor of both the competitors and the jury. The Ford is now outlawed, but Depasse declares that it is his intention to bring the matter before the civil court immediately on returning to Paris.

As far as its technical value is concerned, the Tour de France is looked upon as nothing more than a huge joy ride. The only stipulation is that the competitors shall maintain an average speed of about 18 3-4 miles an hour over daily runs varying from 200 to 230 miles.

As an instance of the liberality of the promoters in some respects it may be mentioned that the three competing Benz cars are accompanied by a 40-horsepower model carrying spare tires, wheels, gasoline, oil, tools, a couple of mechanics, and everything necessary for making good a most serious breakdown. As the cars travel together, there are eight skilled men available in case of any difficulty, and as many tools as can be found in the average workshop. The other competitors have protested, but as this practice is not forbidden in the rules, the promoters have allowed the practice to continue unrebuked.

Papers Read by Factory Men

Long-Stroke Motors, Valve Mechanisms and Self-Starters Among the Subjects Covered

sure a continuous crankshaft rotation up to the tank capacity. Thirty pounds will turn the motor. This method, of course, cannot put a greater pressure in the tank than that in the cylinder. Running idle 30 pounds is produced. Under motor load, as high as 200 pounds may be obtained."

Sterling's talk on "Valve Mechanism" was a discussion of existing types of valve gears. He said in part:

"The measure of efficiency of a valve mechanism is the manner in which it performs its functions. Theoretically, this would mean a study of valve-opening diagrams and determination of the intake and exhaust gas velocities, the power consumed in the operation of the mechanism, etc. Practically, however, the measure of the efficiency as it appears to the automobile builder is more closely allied to the durability, reliability, simplicity and ease of manufacture of the valve mechanism. To these requisites has been added quietness of operation.

Substitutes for Poppet Valves

"In searching for a substitute for a poppet valve, perhaps the most obvious solution to the problem is the substitution of piston valves operated from an eccentric or small crankshaft in place of the cam operated poppet valves. Up to this time none of the many designs of this type which have been produced has been taken very seriously by automobile manufacturers. As a rule, these mechanisms consist of one or more pistons reciprocated in a valve cylinder into which ports from the working cylinder have been cut. These ports are covered and uncovered by the piston valve during the desired period of valve opening and many ingenious arrangements have been worked out.

"Another obvious solution of a quiet and positive valve action is that of the rotary valve, and many patents on this type have been taken out by designers. This type of valve construction on stationary engine designs have in the past deterred the automobile builder from trying this out."

With President E. R. Roberts as chairman, the society opened the meeting with a discussion by Henry Souther on non-poppet valves. He brought out the fact that engines with positive control deliver more power than poppet valve engines, as it is quite possible in these to give sufficient area and opening for any mean effective pressure whereas poppets are limited by a spring inertia above speed of 1,500 revolutions.



Richard driving Daimler-Benz between Nice and Marseilles



Schneider, Bardeau driver, emerging from tunnel near Nice

Efficient Charging of Electric Batteries

Discussing Some of the Complications That Arise in Preparing Electric Vehicles for Duty—How to Overcome Them

NEW YORK, March 27—J. F. Lincoln, vice-president of the Lincoln Electric Company, Cleveland, Ohio, read a paper last night before the Electric Vehicle Association of America, which had for its subject the "Efficient Charging of Electric Automobile Batteries."

The reasons for the complication in properly charging storage batteries for automobiles are that the batteries in the cars which are now in actual operation require voltages which on the smallest number of cells are 30, and on the largest number of cells about 120; that practically all the intermediate voltages between these limits are needed, and that the rates at which these batteries are charged on the usual passenger or pleasure vehicle will vary from 15 to 60 amperes, according to Mr. Lincoln.

It was explained that the usual method of taking care of these different voltages is to get a single voltage, usually 125, which will be high enough to charge any of the batteries, and then by the use of a rheostat reduce this voltage to that which the battery requires. The great drawbacks to this method are the loss in the rheostat, varying from 5 per cent. to 80 per cent., and the impossibility of giving the battery a gradually lessening or tapering charge unless closely watched by the operator.

Eliminating Charging Disadvantages

The problem for the garage operator is to eliminate these disadvantages as far as possible. One of the most usual methods of increasing the efficiency is to charge two or more batteries in series on the 125-volts circuit. This would be an advantage, if it were possible to get in actual practice two or more cars of the same battery size having the same state of battery discharge at the same time. The garage man usually puts any two cars which happen to come in at the same time on the line in series, with the result that the battery which is the least discharged is recharged at the rate determined by the more nearly exhausted battery. Consequently, one or the other of the batteries does not get the proper tapering charge.

Mercury arc rectifiers are even worse than the system having only two batteries in series, according to Mr. Lincoln, since there are sometimes as many as five cars being charged from the same series circuit at one time. The detrimental effects already explained are thus multiplied, it being just that much more difficult to get five cars whose batteries should be charged at the same rate.

Mr. Lincoln outlined what he considered to be an ideal charging system, stating that on account of the wide diversity of voltages required it would be necessary for the ideal system to take care of this condition, as well as providing separate charging rates and tapering charges for each separate battery.

To meet the requirements of such a system the company represented by Mr. Lincoln has devised special apparatus, consisting of a motor-generator set and a small direct-connected double-commutator booster. The latter serves to add or subtract from the voltage of the main generator, thus varying the charging voltage to meet the demands of the battery. Other advantages of the Lincoln system were brought out, and the matter of cost as well as its application to both alternating and direct current were discussed.

For the private car owner who has a charging outfit Mr. Lincoln stated that, while the rectifier is more efficient electrically than a motor-generator set, the cost of tubes for the former for the usual private garage is so high that the small difference

in electrical efficiency is more than over-balanced by the necessity for changing tubes, which are guaranteed by their makers for 600 hours.

Following the reading of the paper, discussion of it was invited. Mr. Harris, of the New York Edison Company, deplored the fact that there are so many kinds, varying sizes and numbers of cells. He stated that, contrary to Mr. Lincoln's statements, it is possible to give a battery a tapering charge without the use of a rheostat. To substantiate this claim, curves showing a practically constant drop in voltage with the increase of time of charge were exhibited.

Mr. Lincoln pointed out that the conditions under which the particular charging test recorded by Mr. Harris was conducted, namely a 115-volt direct current line, were ideal for charging without rheostat, but that with any other conditions of charging current, it could not be done so efficiently.

Mr. Scheff, of the Westinghouse Electric and Manufacturing Company, stated that he has realized the waste which is going on in the ordinary garage as outlined in the paper, but that he has been working along a somewhat different line from Mr. Lincoln in finding a remedy. While the system which he proposes makes use of a motor-generator set, the voltage variation is made possible through field regulation, rather than through the use of a booster.

Mr. Brackett, of the Westinghouse Company, was of the opinion that the Lincoln multi-voltage system is designed primarily for the large installation rather than for the private owner, who he believes gets better service out of the mercury arc rectifier. The method of placing rectifiers in parallel was outlined by him, and he believed that rectifiers are cheaper, in addition to having greater efficiency, as admitted by Mr. Lincoln. In case of the shutting off of the supply current during the night, no protective device, such as the motor-generator set requires, is needed by the rectifier. The latter device has the advantage of starting again as soon as the supply current is resumed, which is not true with the motor-generator set. Thus, the private owner is sure of having his machine charged by morning with the rectifier, according to Mr. Brackett.

Long Life of Arc Rectifiers

Mr. Russell, of the General Electric Company, stated that the life of 600 hours Mr. Lincoln credits to the rectifier is decidedly short, the average life in private and public garages being about 1000 hours. In one instance, he said, a rectifier tube lasted for 12,000 hours. There are about 10,000 rectifiers in private use, he added. Mr. Lincoln stated that if the tube makers considered the 600-hour figure to be low, they would increase the guarantee on them.

Mr. Lloyd, of the General Vehicle Company, advocated the use of standard batteries. There is too much politics in storage battery manufacture, he said. In his opinion, it will not be many years before the low-voltage battery is eliminated from the field.

THE FIRST MEETING of the New York Orphans' Automobile Day Association for this year was held on Wednesday, March 20, at the residence of Mrs. T. M. Smith, vice-president. Wednesday, June 5, was selected for the annual event, on which occasion over 6000 orphans from the city's charitable institutions will be given an outing.

Caring for the Metal Automobile Body

Points to Be Considered by the Car Owner and Garage Manager in Maintaining Its Finish and Appearance

THE fact should be kept in mind that the finish and maintenance of the metal car body is a matter deserving the attention of the car owner to even a greater extent than the painter is able to give it. The painter can only plan and build and care for the painted and finished surface during the car's brief respite in the shop. Out on the road and amid the strife of service the responsibility is taken seriously depends the condition and wear of the finish.

There are two methods of painting and finishing the metal automobile body—or perhaps we should say, to speak more correctly, three methods. One consists in coating up and finishing quite in the same way as the wood body is brought to a finish. The second consists in oven-baking each coat of material applied, bringing the work along in brief yet leisurely manner. The third method provides for painting and finishing the body in 3 days. That is to say, the body is taken into the shop, say, on Monday morning, and Wednesday night it is finished complete.

During this time it has been coated up with surfacers, rubbed out, colored, given one coat of varnish color, two coats of rubbing varnish and one coat of finishing varnish.

It is often the case that the body receives two coats of rubbing varnish, each coat being rubbed with water and pumice stone, and one coat of finish and varnish in a working day of 10 hours.

In order to provide for this rapid handling of the various painting and finishing operations a drying room, or what in reality is an oven in modified form, is made a part of the paint shop. Into such an apartment the car may be run and subjected to a heat varying from 120 to 300 degrees Fahrenheit, as the requirements of the material used demand. As a matter of fact, in these ovens the paint and the varnish applied to the wheels, chassis, fender and so on are baked after each coat.

Concerning this abbreviated system of oven-baking the paint and finish upon the car, the car owner may with good reason entertain suspicion. Paint and varnish experts who have gone into the matter thoroughly pronounce the system altogether too quick. In other words, it is practically a forcing system through the medium of which an abnormal strain is imposed upon both the paint and the varnish, and as a result of which the natural life of the finished surface is necessarily considerably shortened.

Once Started, Deterioration Rapid

When decay and the perishing stage of the finish thus developed sets in, the car owner may expect trouble, for great is the brittleness and the flaking propensity of the oven-baked paint surface once the period of its decline begins. This rule, of course, applies to both the surface baked after the usual practice and to that put through on the 3-day schedule.

The finish on the metal body if put on over a primary foundation strong and rich in the elements of wear and in its capacity to stick closer than a brother to the metal, need not, and indeed should not, give the car owner any greater trouble to maintain it in good order than that applied to the wood body. The main thing is to keep the original finish well protected under fine and vigorous coats of varnish, and to have every fragment of finish splintered or chipped off through accident or otherwise, immediately touched up and faced over with enough material of

the various sorts to afford ample protection to the metal. Wherever the metal is exposed it should upon discovery immediately receive a coat of some elastic material to prevent the development of rust. A rust spot once started is practically certain to grow, and spread, and weaken, and eat the heart out of the sheet steel body. Hand emerying, scraping, sandpapering, and, in short, every other treatment, excepting the sand blast, will prove ineffective in killing the rust.

Cold weather months are especially trying on the metal-finished surface, due not infrequently to sudden expansion and contraction of the metal.

The flaking and peeling of the finish clean to the metal has during the past winter given some car owners no little trouble. The car body surface when newly painted if left for some time in a warm garage or storage quarters and then taken directly out into a temperature extremely cold is fairly certain to suffer violent contraction, during the course of which the paint and varnish is first enormously strained, then fractured, and perhaps ultimately rolled like parchment from the metal. Such usage of the metal surface should be avoided as far as possible.

Uniform Temperature a Necessity

The garage or storage quarters for metal body cars had best be heated only to a moderate temperature and such heat should be uniformly maintained. An overheated storage apartment for the car offers about the worst conditions to which the car can be exposed. This is notably true of cars that are used daily during the winter and in this way exposed to practically every extreme of both road and weather conditions.

The fact should not be overlooked that the metal surface at the beginning offers no such secure foothold for the paint fabric as does the wood surface. At best, it is a hard, and, in a sense, an unyielding surface of negative properties to which the paint adheres only through a reinforcing process worked out by the painter.

When the metal car body is sent to the shop for repainting the owner owes it to his own individual interest to send instructions which provide, in substance, for the use of paints and colors containing sufficient pure raw linseed oil to give them the maximum elasticity consistent with the best finishing results.

The mud and accumulations of city streets are charged strongly with ammonia. In the country, clay soils and the soil containing lime found in the highways usually take hard hold of the varnish, extracting the oil by saponification.

This furnishes a strong reason for vigilance on the part of all those concerned with the upkeep of the car. Apparently, when a varnish on the metal surface spots, it shows the effects of the trouble more than will the varnish on the wood body.

Garages in which coal stove gases, blacksmith forge gases, and, for that matter, other forms of gas which develop in imperfectly ventilated quarters, should be shunned, or made wholesome. All such gases attack varnish in short order, and while they affect the surface differently, if allowed to go, they are practically certain to kill the luster.

Equal parts of raw linseed oil, turpentine and alcohol, rubbed on the surface spots from which the oil has been extracted, and then polished dry with blotting paper, will sometimes restore the luster. This remedy failing, the only alternative is to revarnish the surface.

Irregular Wear of Some Solid Twin Tires

German Army Complains That the Inner Tire of a Pair Gives Out Before Its Mate
—Crowned Roads the Probable Cause—New Shapes to Obviate the Trouble

"SOLID twin tires used for the driving wheels of heavy trucks have the disadvantage that the inner tire is always overloaded and therefore wears down considerably before the outer one shows any but superficial signs of service." This observation, coming from Colonel Fritz Listemann, of the German army reserve and set forth by him in *Der Motorwagen* of February 20, may be considered as authentic, relating as it does directly to the experience gained in prolonged military testing of heavy army motor trucks. The armies of Europe may in some respects be considered as a special and reliable service-testing department at the disposal of the automobile industry.

The observation, while doubtless correct as far as it goes, does not include all the facts of interest in the case. It is not stated, for example, that the inner tire continues to wear more than the outer one, but only that it does so in the beginning. It stands to reason that, in proportion as the inner tire wears down, the load and wear will shift more and more to the outer tire, and that at some point an equality in wear will be reached. If, then, the two wearing surfaces were from the beginning brought into the relation in which the wear is equal, the disadvantage referred to would probably never come into existence. In other words, if the outer one of the twin tires were made thicker, the wear would average equal. But solid twin tires have not so far been made on that principle. They are true twins, at their birth.

Probably there is a real loss involved in the unequal wear. It is not only that the outer tire is saved as much as the inner one is permitted to suffer, and that the two actions compensate one for the other. The overloading of the inner tire, which the excessive wear brings in evidence, causes also its disintegration and too rapid deterioration, as there is a maximum load for each cubic inch of rubber material which cannot be transgressed without incurring this consequence. Much of the art in tire building lies in so shaping and distributing the rubber and the can-

vas that the maximum allowable stresses are at no point exceeded. Equality of wear is important. Any local defect easily converts itself into an all-around ailment, where tires are concerned.

It might be suggested that the inner tire of twins, speaking of solid tires only, might be made broader than the outer one, and that equality in wear might be accomplished in that manner without getting the unsightly truncated cone effect which would be the result of a variation in the two diameters. This would be in accordance with the principle of strengthening those parts which show the need of it.

Suggested Causes of Unequal Wear

Some nice questions spring up at this suggestion. If, for example, the reduced wear of the outer tire is due not to reduced stresses when the tire is in action, but to lesser frequency of substantially the same stresses, which the inner tire is called upon to sustain, it would not be quite correct to reduce the amount of rubber, much less the area of wearing surface, in the outer tire, since it is the intensity of stresses rather than their frequency by which these factors—the bulk and areas of the tire material—should be determined. And, if it is assumed that the whole observed fact of unequal wear also has some bearing on the wear of broad solid rubber truck tires of the single type and perhaps on the twin pneumatic tires now coming into general favor for rapid trucks and heavy cars—even though no authentic observations are available with regard to these types—it is at once suspicious that a remedy consisting in the broadening of the inner tire would be inapplicable. In the case of the single solid it would simply have no sense, and in the case of the pneumatic twin tire it would almost of necessity—since a flattened profile for pneumatic tires is not practical—involve a larger diameter for the inner tire. The relations between the inner and outer tire of the pair would then be exactly opposite to those brought about by wear in the trucks of the German army. The remedy would seem to run contrary to the facts, even though it is usually sound practice to fortify most those parts which wear most.

An inquiry into the causes which probably lie behind the unequal wear should bring a better remedy. What causes could there be for wearing down the inner tires first? If the axles were not rigid enough, in these army trucks, their ends might bend up, and that would take the outer tire off the ground, while placing the whole load on the inner ones. But there is nothing whatever in the very complete specifications now drawn up for the next order for army trucks which would confirm a suspicion of this kind. On the contrary, these trucks are very substantial. There must have been some other reason. In the beginning when twin tires were introduced the wheels were a makeshift. The rims were broadened to accommodate the increased width of the tires, but the spokes supported mainly the inner portion of this broadened felloe, the outer portion constituting an overhang finding its support in the rigidity and strength of the rim as a whole, while causing excessive stresses upon the bearing balls or rollers in the wheel hub. Naturally there was some little extra elasticity and yielding in this overhang flange, and the tire mounted directly upon it received the benefit of a cushioning which toned down the worst shocks and

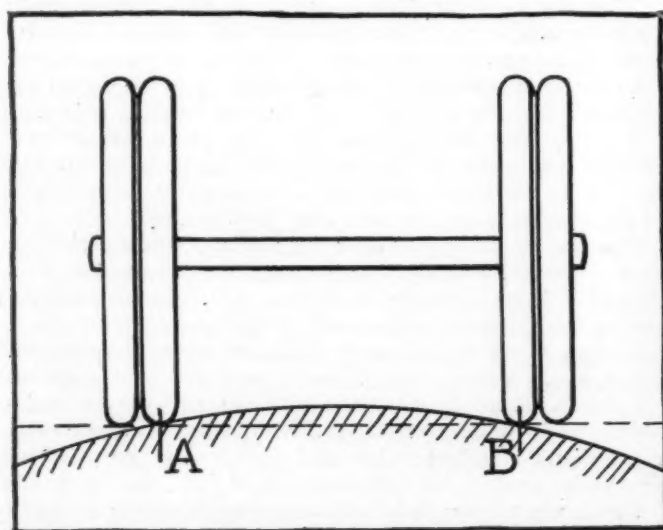


Fig. 1—Diagram indicating why solid twin tires on German army trucks wore unequally on hard roads—A and B points of maximum wear

the most sudden abrasive stresses experienced in driving over hard or rough roads. This explanation, however, does not fit the case, either, for an examination of the drawings representing the German army truck of the type in question shows wheels in which the spokes support the rim squarely in a central plane.

Perhaps the true explanation is to be found outside of the vehicle itself. It has been said that the road is the other half of the automobile. In relation to the tires and their wear, the road is perhaps the more important half, if not the better one. Now, hard roads, which are those which wear most on tires, usually possess the peculiarity of being crowned, so as to shed water readily. The cross-section of a well-built road shows a curve. No part of it can be flat transversely without inviting the formation of pools after every rain and increasing the cost of its maintenance. Even the city streets with street car tracks along the middle have a slight curve in the side slopes. Evidently if solid twin tires shall be expected to wear evenly, they must be in equally intimate contact with this curved road surface. If they are constructed to support certain loads and driving strains by virtue of their combined dimensions, such a relation to the crowned road as is shown in Fig. 1 will overload the inner tire of the two and will wear it down, while at the same time deteriorating it by undue fiber stresses until the two tires finally take the same relations to the road surface. And this is the result which is actually recorded for the German army trucks. Possibly they may have been tried out, in the main, over a set of roads offering an unusual uniformity of conditions. The effects might be less pronounced in the case of trucks tried out over American roads or any roads presenting much diversity in the finish of the road surface. A perfectly straight-lined surface would somewhat offset the unequal wear previously produced by highly crowned surfaces. There is a question of averages. But in principle it is clear that, if the explanation which seems the most plausible one for the observed fact is the true one, solid twin tires should preferably conform, when first mounted on the wheel, to the average road crowning curve. The outer tire might be of larger diameter than the inner one. The truncated cone should point toward the vehicle. If a suitable small camber of the rear wheel axle would not interfere with the driving system, the correct relations could be brought about by this means without any variation in the tire sizes, and this would be desirable, since that which is wanted is that the whole load shall be carried evenly distributed on both tires.

German Makers Seeking Remedy

In broad solid truck tires of the single type the tread profile is usually so strongly curved that even the crowned road surface can scarcely shift the line of maximum stress and wear more than possibly 1 inch inwardly, and compensation for this inequality could perhaps be provided by building up the outer half of the tire with a little more rubber and a slightly steeper curve. In the case of pneumatic twin tires, where wear means only deterioration, but not a reduction of the cushioning qualities, the whole question is probably absorbed in the more elusive one of how the inflation of the twin tubes shall be maintained in the most suitable relations. It seems almost obvious that less would be gained by attempting to vary the inflation, as between the two tires of a pair, than by keeping it uniform by means of a connecting air channel, provided that such a channel may be closed up when desired, so as not to forfeit the advantage of riding on one tire when the other is out of order.

What happened in Germany after the unequal wear had been ascertained shows that, on the other hand, considerable importance is attached to the whole subject where solid twin tires are concerned. The army authorities requested the tire makers to provide tires in which the unequal wear would not be encountered, and in response the broad 280 millimeter (11 inches) wide single type tire, of which a section is shown in Fig. 2, was turned out. It was tested on the trial wagon for the new army motor truck train, but the rear axle load on this vehicle had for this trial been reduced to 5,500 kilograms and the roads

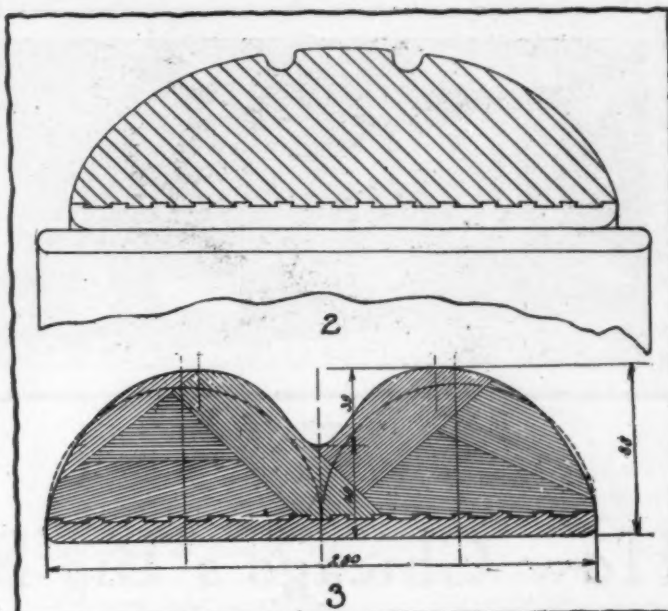


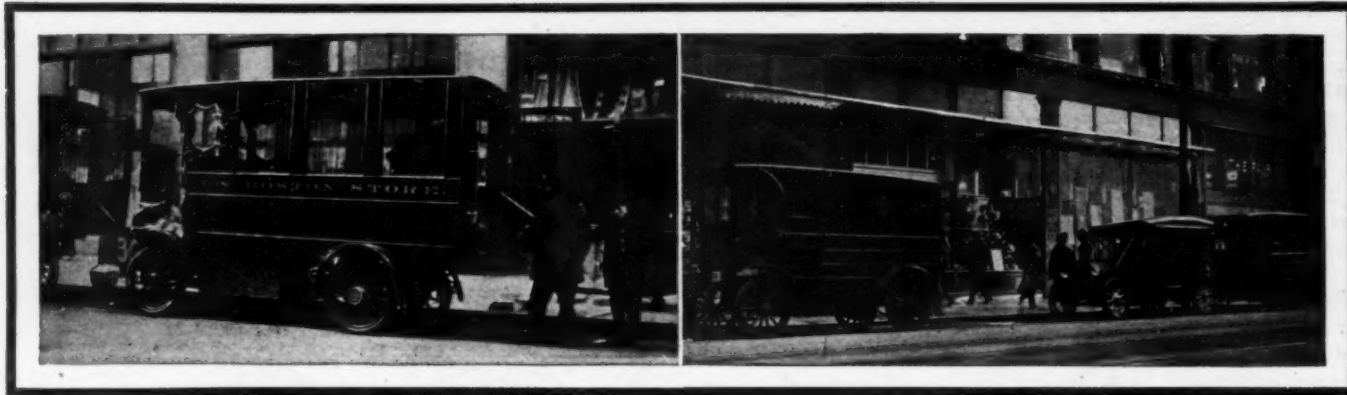
Fig. 2—Section of tire 280 millimeters (11 inches) broad rejected by German army as not equal to twin tires, of 140 mm. each, for prevention of skidding, but found to give much longer life in heavy brewery work

Fig. 3—Section of new 280 mm. single-width tire, with deep central groove, admitted for German army trucks—in dotted line, section of twin tires of same total width found to wear unevenly

were most of the time wet and slippery, and under these circumstances the tires did not quite come up to the expectations in the eyes of the army people. A request was made for another type coming nearer to the twin type and giving the security against skidding which this type affords, while yet not subject to the unequal wear which was the original objection to it. It is to be said, however, comments Colonel Listemann, that the inferences from the trial of the new broad single type tire cannot be considered conclusive, as there was no opportunity at the trial for comparison with an equally heavy vehicle fitted with twin tires. Moreover, this new single type tire was fitted in a number of instances to heavy vehicles, such as brewery wagons with large rear axle loads, and mileages were reached exceeding 16,000 kilometers, and this was more than doubling the mileage obtained, in the same work, from an equipment with normal twin tires of 140 millimeters each.

To meet the objections of the army people, however, the tire makers turned out a new type, which is shown in section in Fig. 3, and this is now admissible for the army wagons on even terms with the original twin tire type of the same width. For comparison, the section of the latter is shown in dotted lines. It will be noticed that the new model, while belonging to the single type, has two treads and that the center lines of the treads are a little closer together than the corresponding lines in the twin tires, so that the road surface curvature will count less strongly for producing inequality in the wear. It also has more material, and the improved cushioning resulting from this feature may also have some bearing on the equalization of the wear. The central groove reaches to the wear limit allowed for army work.

Tire Menace in Fast Driving—Speed is the most important of all the deteriorating influences to which tires are subjected. It has been determined that at an average of 12 miles an hour the life of a solid tire approximates 10,000 miles, while at an average speed of 20 miles an hour it would be a candidate for the scrap heap at the end of about 4,000 miles. At still higher speeds its life would be materially shorter and extremely precarious. These facts established, the manager of a motor delivery service who fails to insist upon a strict observance of moderate speeds is not studying the best interests of his employer.



One of the Boston Store's large electrics

Electric of similar type in The Fair service

How Chicago's Big Stores Handle Goods

Automobile Delivery Systems Largely Made Up of Electric Vehicles, Which Are Specially Adapted to Congested Traffic

IN the delivery service of the large department stores of Chicago, the commercial vehicle finds great favor. It had humble beginnings in every case, and each concern was rather skeptical as to its merits at first. But these small installations of perhaps two or three machines have been increased each season since their inception by lots of three or four until now the typical installation numbers about twenty. In no instance has their use been discontinued after it has once been begun.

There are in use in Chicago 592 trucks which have a capacity of a ton or more, and eighty-eight of these are in the department store service. This is nearly 15 per cent. of the whole, the next largest class of users being the packers, who have 10 per cent. for their work.

A large part of the trucks credited to department store delivery are of the electric type.

At present, the Carson, Pirie, Scott Company has the largest number of small machines in its service. The use of electrics was started by the firm in October, 1910, when five machines of the Detroit make were put into its delivery system. This original five has been added to in lots of one, two and three at a time up to April of last year, when the last lot, which brought the total up to twenty-five, was put into service. In addition to these, the company now operates eleven gasoline machines, and is contemplating the buying of a number more of both electric and gasoline types.

All of the electrics are of the 1,000-pound class, and they are quartered in several stations in different parts of the city. The main station is located at Forty-seventh street and Greenwood avenue on the South Side. Ten machines are kept here, and they serve the extreme south end, and the suburbs of Pullman, West Pullman, Kensington, and Morgan Park. This territory includes that portion of the city which extends from Thirtieth street south to 135th street.

Three machines of the fleet are cared for at the Detroit Electric garage and charging station on Michigan avenue, and these handle a large West Side territory.

Store Assumes No Responsibility

On the North Side, twelve more machines are in service. Six of these cover the delivery as far north as Lake Bluff, while five more of them are quartered in the Evanston branch

of the Anderson Electric Car Company. The remaining one of the twelve is kept at Highland Park. To this machine, packages are sent several times a day by train, the electric vehicle attending to the deliveries from the Highland Park suburban station.

One machine of the fleet is quartered at the Michigan avenue garage of the Anderson company for special and emergency work. It is kept in readiness at all times for immediate service should anything happen to any of the other machines; or for extra work when the regular delivery is not adequate to the amount of goods to be distributed, such as at Christmas and other holiday times.

No responsibility for the care and maintenance of its twenty-five electric delivery cars of the Detroit make is assumed by the Carson, Pirie, Scott Company, all repairs and business connected with maintenance of the machines being taken care of by the Chicago branch of the Anderson-Electric Car Company, maker of the Detroit electrics.

Service Policy Broad in Scope

When tires need replacement, motors require overhauling or other repair work is deemed necessary by the truck department of the Anderson company, this is done at its discretion and is sanctioned and paid for by the department store. In a word, the latter concern looks to the makers of its electrics for everything pertaining to them. Should any contingency arise whereby its delivery service is crippled by its electrics, the Anderson company is held responsible, and must take machines from its own garages to make up for those of the Carson, Pirie, Scott Company which are out of service. These latter machines must be used for such work until the department store's own trucks are again put on their regular schedule. The delivery of goods must not be delayed in any way, and it is up to the electric company to see that such a condition does not arise.

To bring out how extensive is the scope of the Anderson Electric Car Company's care of the transportation features of this large department store's business, it might be mentioned that even to the procuring of state and city licenses for the drivers the former concern is the moving spirit. The department store knows only that its deliveries are being taken care of, and it pays for the service, the drivers' wages and the operative costs. There its care of the fleet ends.

This is an entirely new phase of the service which makers of electrics are rendering buyers, and it brings out more forcibly than ever the statement which has been made that the buyer of a commercial vehicle is today the best-protected man in the business world.

Each day a report of the condition of these electrics is received by the manager of the truck department of the Detroit company branch. It covers every machine in this service, each being designated by a number. The number of miles traveled the day previous, the battery condition, charging data, etc., are reported on. By this means costs are accurately kept on all the units of the installation, and reliable figures are compiled, showing per ton-mile operative figures and the like.

For instance, a report covering the performance and condition of the trucks on February 1, 1912, brings out the following figures:

Average mileage per truck..... 24.3 miles
Average number of stops per truck.... 154
Power required to charge machines.... 0.6 kilowatt per mile

Most of these machines are charged from 110-volt direct-current lines, but seven of them are charged by means of motor-generator sets. In view of this fact and since charging with motor-generators and transformer outfits is a somewhat inefficient method, this figure of 0.6 kilowatt per mile is a low one.

On the average the tires on these electrics run as high as 12,000 miles per set of four.

The eleven gasoline machines which are in the service of the Carson, Pirie, Scott Company are of 2-ton and 3-ton capacities. Some of these large trucks are used to transfer the goods from the store to the substations, from which they are distributed to the customers by the smaller Detroit electrics. Several of these big trucks, however, are also in regular delivery service, being used for the conveying of large merchandise, such as furniture and the like, which articles are too large and bulky to be accommodated by the smaller machines.

How the Substations are Supplied

The goods which they carry is delivered direct to the purchasers, and they are run independently of the substations, thus doing away with the extra cost which would be incurred by a system which required double handling of heavy pieces.

The trucks which ply between the outlying stations and the main store are loaded with large boxes much the same in appearance as trunks. Each box or trunk is filled with packages for a particular subdivision of the territory over which the

substation holds sway, so that when the truck arrives no resorting there is necessary. The trunks are reloaded into the waiting electric delivery trucks, each electric operator taking charge of a given subdivision. This is a large time-saving feature of the system.

These big machines do no other part of the delivery business save the transferring of the goods from the store to the substations. They make trips on regular schedules, which are adhered to surprisingly well, considering the Chicago traffic congestion and the general conditions of the streets. Each truck makes two trips a day.

Sixteen more electric delivery cars have been ordered by this particular store, so well pleased is it with the service which has been rendered by those now in use.

The Fair System at Its Depots

The delivery territory of The Fair in Chicago is divided up into three sections, and there is a substation located centrally in each. To these distributing points the large trucks bring the goods from the main store.

The depot for North Side distribution is located at Forty-sixth street and Irving Park Boulevard, while the station at Forty-sixth street and Madison avenue takes care of all West Side deliveries. For the South Side the building is located at Seventy-first street and Wabash avenue.

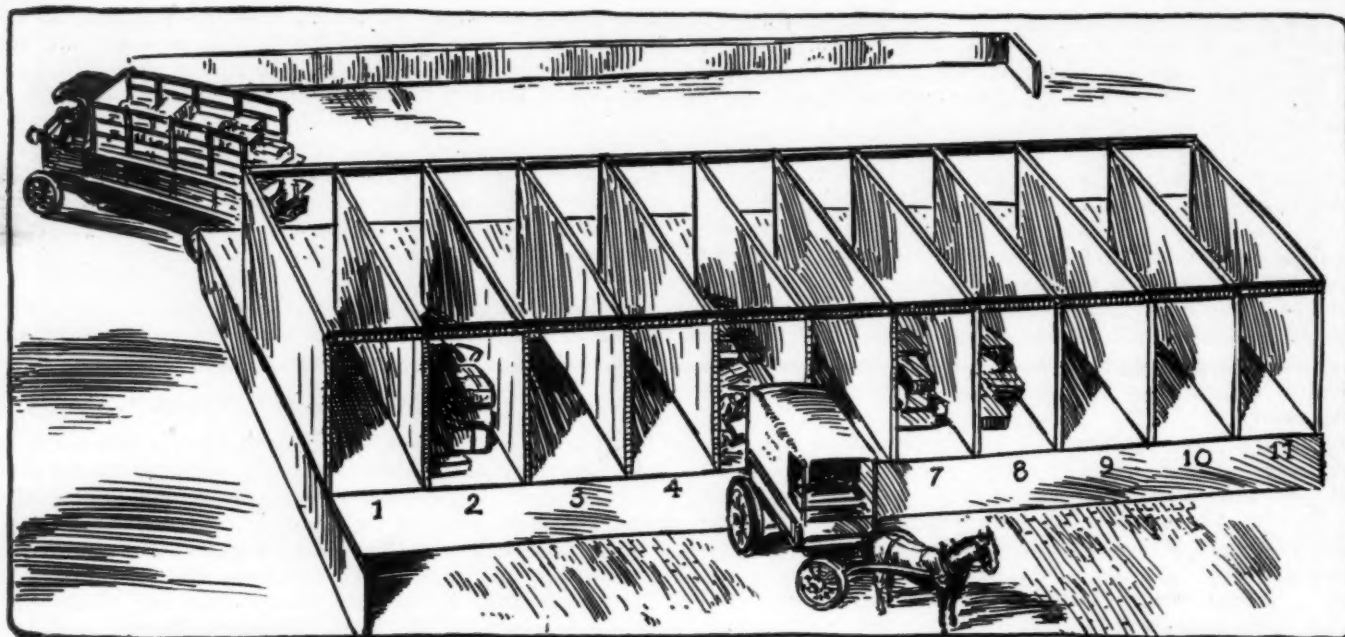
These substations are numbered, and the packages, after being wrapped in the shipping room, go to sorters who simply write on them the number of the station from which they will ultimately be delivered to the customers. They are then loaded into the small hand trucks and the latter are in turn wheeled onto the elevators which lift them to the street. Here the large trucks are waiting to convey the packages to their respective depots. The packages are loaded from the hand trucks into the cars according to the numbers which have been put on them by the sorters in the shipping room.

Two trips are made each day by each of the substation feeders, one at 2 p. m. and the other at 7 p. m. On Saturdays three trips are made, at 2, 5 and 7 p. m. The average run to a distributing depot is 6 miles and this is ordinarily made in 45 minutes, some time being lost due to traffic congestion.

On arriving at the substation the truck drives into a paved way and backs up to an unloading and sorting platform. On the other side of this platform single horse wagons are backed up, each waiting to receive its share of the contents of the truck. Light delivery trucks have not as yet entirely replaced



Portion of the fleet of Detroit electric delivery cars in the service of the Carson, Pirie, Scott Company, Chicago



Showing the system of distributing bins for local delivery from The Fair's substations in Chicago suburbs

the single horse wagons for territory distribution from the depots of The Fair.

Unloading of the trucks is accomplished mostly by boys who throw the packages into stalls on the platform according to numbers on the sales slips. The packages which have been put in each of these stalls are then sorted in the right order for the route by the driver and his boy assistant. It requires 15 minutes from the time the large truck arrives from the store until the delivery wagons are on their way to the purchasers of the goods.

At one of these three substations eleven one-horse wagons are used in addition to a Packard truck, which takes care of the Highland Park section.

Four electric trucks have recently been added to the service by the Fair. These are found to take the place of six two-horse teams; they cover half again as much territory as was formerly covered by the teams and make three trips a day to the horse vehicles' two.

For charging the storage batteries of its electrics the Fair has its own charging station and generates its own electricity. This has been found to be a very economical proposition, at least in this particular case.

Daily reports of vehicle performance are made to the superintendent of delivery. Each machine is numbered, and the amount of gasoline and oil, if it is a gasoline truck, or the charging records if it is an electric, are accurately kept. From these, monthly statements of vehicle costs are compiled. On the latter the repairs made during the month, the tire expense, accidents and any other costs of maintenance are entered, so that the exact cost of each vehicle on a ton-mile or any other basis can be figured. Every item of importance which has anything to do with the service of these delivery trucks is accurately recorded. In this way each vehicle's performance is checked against that of every other machine.

Figures taken at random from these Fair records show the following:

- 21 gasoline trucks,
- 5 electric trucks,
- Average mileage, 41 miles per day,
- Average number of stops (delivery cars), 250.

These figures show a vehicle performance a little above the average, although they can be duplicated in any installation where an equally good system is employed.

Road repairs are made by the drivers of the machines, if within their ability. At the end of the day's run a slip must be filled out stating just what repairs and adjustments have been

made, and if there is any part of the car which needs tuning up or adjusting when the car is left for the night this fact is noted on a special form of card which goes to the night man. It is his duty to see that such repair is made before the machine leaves the garage the following morning. Thus, the minimum amount of time is wasted for repairs.

The Boston Store has three substations to take care of its city delivery, they being located very near to those of The Fair in the same localities. This is not to be wondered at, since the conditions of its delivery service closely parallel those of The Fair.

Linking Boston Store to Suburbs

Large power wagons form the connecting link between the store and these stations, and two trips are made each day, one at 2 p. m. and the other at 5:30 p. m. Two hours are allotted to each machine as a loading time at the store, and the packages for each machine are sorted by the shipping clerks in the basement. After sorting, these bundles are placed in hand trucks and conveyed to the sidewalk by lifts. They are then tossed into the truck which is to go to the sub-station designated by the number on their delivery tickets.

During last year's holiday week 15,000 packages were handled by one of the depots of this store, while another took care of an even greater number, approximately 17,000 going through it. The routers become very expert at marking the bundles after they have gone through several rush seasons such as this.

For suburban customers of the Boston store delivers as far north as Waukegan, to Hammond on the South Side and to West Chicago on the west.

Two electrics having capacities of 2,500 pounds take charge of deliveries in the territory between that covered by the substations and the very near deliveries, which are handled by a number of single-horse wagons. Each of these two electrics makes two trips a day with the exception of Saturdays, when three are made. On the average they cover about 40 miles as an ordinary day's run, and the number of parcels delivered by each ranges around 225 a day.

For heavy and bulky delivery each station quarters a Grubowsky gasoline truck. These are of 1-ton capacity and they average 50 miles a day.

No more convincing proofs of the increasing general use of the commercial vehicle for delivery service can be found than those furnished by the large city department stores, which have added to their original equipments from year to year.

The Westinghouse Air Spring

Airbrake Principle Is Applied in the Construction of a Heavily Wrought and Efficacious Shock Preventer

Device Is High in First Cost But Pays by Increasing Tire Economy

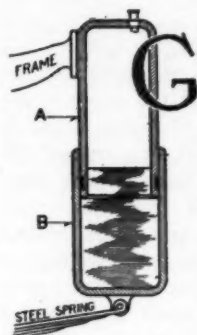


Fig. 1—Simplified illustration of Westinghouse air spring

GEORGE WESTINGHOUSE, inventor of the airbrake, has come to the fore with a shock preventer designated by him as an air spring. This device is constructed to go between the spring shackle and the body, and, by its inherent features, to limit the movement of the springs to a normal amount.

While in appearance the Westinghouse air spring resembles a big, cylindrical shock-absorber, stress is laid by the inventor and his manufacturing associates upon the fact that the device is a spring in which the air is compressed to take the excess strain away from the regular suspension and to take up the shocks which would otherwise be transmitted from the axles to the body, while the gradual expansion of the air regaining its initial volume annihilates the rebound which is as disagreeable to the passenger as it is harmful to the chassis frame, motor, body and tires.

Advantage is taken in the construction of the Westinghouse spring of the perfect elasticity of gases, more specifically of air. If air is compressed to any degree and then permitted to expand again it will, if the original conditions be reached, assume its full former volume. A simplified illustration of the manner in which this property of air is applied in the Westinghouse device is seen in Fig. 1. A and B are two metal cups fitting into one another and filled with air at atmospheric pressure. On telescoping the tubes or cups into one another the air is compressed, absorbing the work of moving the tubes into each other. If the pressure behind the two tubes is taken off the cups return to their original position with decreasing speed. On moving the tubes farther into each other it is noticed that the resistance increases with the travel of one cup into the other, thereby increasing the pressure of the air. By filling part of the inner space with a liquid the travel necessary to compress the air in the tubes to a given pressure is decreased.

Mechanical Details of Device

Fig. 2 shows how this construction is elaborated in practice. Two tubes, A and B, telescope, and a third tube C keeps foreign matter out of A and B. The cross-head E and the tube B to which it is attached are guided in their movements by the steel casting D. At its top end B is enlarged to form a piston which is packed against C by the packing H. The breather J is an air inlet valve packed in fibrous filtering material, which, like the felt wiper ring L, serves to keep dust and grit out of the mechanism. If A and B are moved to compress the air in A, the space between B and C is enlarged and air is drawn in through J. Upon the air in A expanding again the air which has entered through J passes through the passage K into a port surrounding B, and as there is no packing below this point, between B and D, the air blows out between B and D, again serving to keep out foreign matter. The air valve N is designed to adjust the amount of air in the tube A, and M is a screw cap covering it.

The piston PP is fixed to the lower end of A to insure a tight joint between it and the tube B. For this purpose two packing rings and a cup leather are used. U is the hollow

plunger of a single-acting pump. Two collars V and W are secured to the upper end of the plunger, and a sliding disk X is installed between them. Normally U is held in its lowest possible position by the spring M which presses on V. If the air in A is compressed the spring M is also compressed and an upward stream of oil rises from B1 until it strikes the sliding disk X.

The disk is raised, thus finally lifting the collar V and plunger of the pump, and making a tight joint with the part V1 and a passage from the chamber B1 through the space closed by ball valve T and up through the plunger into A1. When the spring M extends again the disk X is forced down until it strikes W and forces the plunger to its lowest possible position. The oil thereby forced down passes up by the check valve Y and returns into the space A1.

An important point in the use of this shock-absorber is the necessity of always keeping it full of oil up to a certain level; the latter is determined, in filling the device, by means of a float. The proper initial air pressure is found in the following manner. The oil being filled in up to the correct height, air is pumped in through the check valve N until, with the car and passengers resting on the air spring, the cylinder C1 projects about 2 inches above the casing C2. Then the cap M is screwed onto the valve and the device remains intact till the weight of the car has to be adjusted by a lasting change in the number of passengers. The cylinder should always project 2 inches from the casing to give a smooth and easy riding effect over all sorts of roads and pavements.

The Westinghouse spring, which has been developed by the inventor during the past 3 years, is manufactured by the U. S. Rapid Fire Gun & Powder Company, of Derby, Conn. It is handled in New York City and the metropolitan district by the Walter Motor Truck Company, 40 West Sixty-sixth street, where complete sets of the air springs may be procured or a practical demonstration of its features and riding qualities may be had.

A test made over some very bad pavements in New York City by the representative of THE AUTOMOBILE served to convince him of the efficacy of the Westinghouse device. Ruts as well as bumps are hardly felt at all, and where they make themselves evident their effect is very moderate and might well be estimated at no more than 20 per cent. of the shock created by the inequalities of the road.

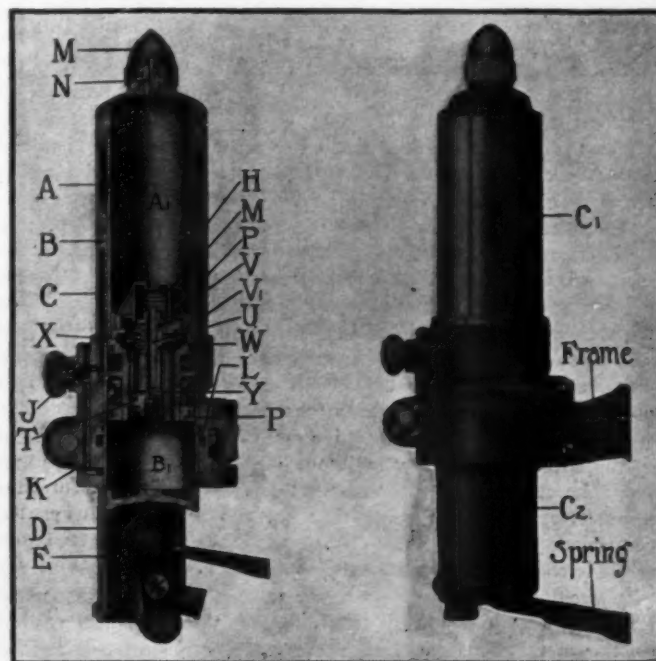
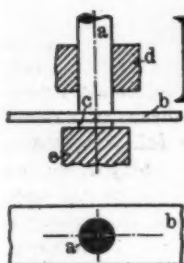


Fig. 2—Section of Westinghouse air spring. Fig. 3—Exterior view of same

Digest of the Leading Foreign Journals

Electric Welders Pick Up the Melt Metal Practice—The Struggle for Silence—Governors Entering at the Back-door—Robust Rustproofing—Old Timer's Advice on Chilly Starts—Tip for Dynamo Makers



The resistance method

IMPROVED ELECTRIC WELDING—

When a rod must be joined endwise to a flat piece, as in the case of the stem and mushroom of a poppet valve for automobile motors, it is usually absolutely necessary that the weld shall be strictly without flaw or weakness. The joint must be so much more intimate as its area is limited, and when the two pieces to be joined are of different composition as well as of different thickness, it has not been found easy to produce a junction of the required reliability by either oxy-acetylene or electric welding. The competition between these two methods has led to improvements, however, in which it is one of the objects to effect a good joint without increasing the thickness and weight of the flat piece beyond the limits dictated by good design. One of the new methods relates to electric welding by the resistance method; another to electric welding by the arc method. The first one is patented by the German General Electric Company (German patent 231,891). According to it, there is placed between the flat piece and the electrode on that side of the work a small flat piece corresponding in shape to the cross-section of the rod, and this piece serves to regulate the electric resistance and the heat distribution in the welding process.

In the illustration, which gives a diagrammatic front view and ground plan of the arrangement, *a* is the rod, *b* the flat piece, *c* the interposed auxiliary piece, and *d* and *e* the two electrodes. The latter are worked out in the form of clutch jaws. The auxiliary piece is of course of the same material as the flat piece. By its use the appearance of a pressure spot on the flat piece, on the opposite side of the weld, is avoided and the strength of the flat piece is increased instead of reduced, in contrast to the results obtained by the ordinary method by which the electrode is in direct touch with the work. If necessary, the extra metal deposited can be ground off afterwards.—From *Der Praktische Maschinen-Konstrukteur*, February 8.

The other method, by the arc welding process, is the invention of Kjellberg and is used in Sweden. It differs essentially from usual arc welding by the special nature of the electrodes. These are composed of a metallic core, intended to supply a portion of the weld metal, and an insulating shell which supplies a flux and also a refractory material forming during the process into a crater at the bottom of which the fusion of the weld metal takes place, protected against the atmosphere and oxidation. The wall thus formed also renders it practicable to undertake a weld at the bottom of a groove without fear that the arc may jump from the electrode to the walls of the groove. These electrodes necessitate the use of continuous current and must always be connected to the positive pole, so that the weld metal will be carried from the electrode to the work and not reversely.

In welding a wrought iron tip onto a cast iron propeller blade by this method, it was found that the composition of the metal along the weld line varied progressively in the transverse direction, indicating a very definite fusion of the two materials.—From *Le Genie Civil*, March 2, after *Engineering*, November 24.

Silent Gears—Many cars of celebrated manufacture are silent on the direct drive but very noisy on the lower gears. How can this be and how can it be remedied? asks Count de Solage of the dispenser of motor wisdom on *La Vie*, and the latter replies in substance that the first requirement for a silent gear box lies in rigid relations between the motor shaft and the primary gear shaft, such as may be brought about by unit design, in which the motor, the clutch and the gear box form a rigid unit, generally mounted in the chassis on the three-point suspension principle, or by having a double universal joint between the clutch and the gear box. What is of importance is that the primary shaft shall turn with uniform speed, so that the pressures of the gear teeth may remain constant and not give rise to vibrations, and, to this end, it is first of all necessary that the motor turn at uniform speed at any throttle adjustment given it. This means that the gears will be more nearly silent the larger the number of cylinders is. The shafts in the gear box should be short and thick, since all flexion of shafts produces variations and vibrations at the circumference of the gears and consequently clatter of the gear teeth. With regard to the ball bearings, it has been observed that bearings of small diameters and large balls make less noise than large diameters and small bearing balls. The pitch line of the gear crowns should of course be strictly concentric with the shafts. Finally, says this authority, it is most important of all that the circumferential speeds of the gear teeth should be as small as possible. The faster the teeth travel the more noise they make; with a motor turning at 2000 revolutions per minute it is well nigh impossible to get gear silence on the low gear speeds.—From *La Vie Automobile*, December 9.

[Some additional considerations in the matter of gear silence may be mentioned. The motor power should be so abundant—which for reasons of fuel economy it rarely is in European cars—that the motor speed need not be pushed to the limit even on the low gears. The diameters of the gear wheels should be as small as consistent with strength, durability and accuracy of the tooth curves, and they should vary as little as possible, as hammering mostly arises where a large diameter drives a small one. These requirements presuppose that a high grade of steel is used, so that a sufficient tooth-strength may be maintained with small dimensions, and they also spell a preference for four gear changes rather than three or two, as the larger number gives a better mechanical chance for avoiding large gear diameters. It is subject to dispute whether a large reduction on the rear axle (or on the jackshaft in the case of chain drive), so that less reduction will be required in the gear box, helps in the matter of silence, although it is mentioned among the advantages of the worm drive—in this respect as well as for road clearance—that it affords a larger reduction on the rear axle than can be had with a bevel gear, if the driving pinion in the latter shall be of sufficient size for durability and good mesh. New and probably better solutions of the silence problem are springing up, however. The clash method of gear-changing cannot be used with them, on the other hand. The jaw clutch and the sliding spline take its place. First, miter or herringbone gears, replacing the spurwheels, avoid clatter by the continuity of their mesh and their oblique attack; an advantage which is not materially altered

by wear. Secondly, gear chains of the silent type have a similar advantage and have had the first call among European designers, perhaps on the ground of shortage of facilities for producing miter or herringbone gears of the required quality and yet at moderate price. Finally, the expedient of mixing powdered cork with the lubricating oil or grease seems worth mentioning on general principles, and particularly when there is question of reducing noise in a finished car already in use.—Ed.]

Virtues of the Governor—Similarly as spring suspension for radiators is drifting into pleasure car construction from the motor truck field, experience with governors on truck motors seems to be responsible for a tendency to take this feature of construction back into favor for pleasure cars as well, especially for cars not provided with abundant power and therefore frequently operated on the low gears. An authority on the actualities in automobiling, Mr. Mortimer Mégret, presents the advantages of a governor, though with special reference to the governors in Brasier cars, in substance as follows:

When one conducts for the first time one of these vehicles, be it a larger or a smaller model, one notices quickly the peculiarity that the motor speed remains constant at all vehicle speeds, despite gear changes. So long as the accelerator and the throttle are not touched, the motor speed is influenced only by changes in the road resistance. Whether on the level, on an incline or on a slope, so long as the road profile and surface remain constant, so does the motor speed. This quality means a real economy in reduced fuel consumption and wear and is due to the governor; a simple centrifugal two-ball governor which would shut off the gas, if it were let alone; no sooner would the motor be started than the governor would stop it. But the throttle lever and the accelerator pedal are there to moderate its activity. A soft spring, which is tightened by the lever, and a stiffer one, which is subject to the pedal, counteract more or less the swinging weights. The soft throttle spring establishes a stable equilibrium between all accelerating and retarding causes, maintaining the motor speed constant. The pedal spring, on the other hand, if tightened, allows the motor to swallow all the gasoline mixture which the carburetor will furnish, and it is then the road which regulates the speed. The governor also permits the driver to maintain the motor speed when unclutching, leaving the inertia of the flywheel at his disposal and, by opening automatically the gas intake at the precise moment when more gas is wanted, gives a powerful yet gradual acceleration; in one word gives the car life.

Apart from the economy, there is comfort in the governor action. The motor does not run wild when started and the driver need not jump from the starting crank to his throttle lever in order to silence it. The possibility of driving without keeping the foot on the accelerator pedal or the finger on the throttle lever and without having to fear that the vehicle will of its own accord exceed the gait at which the controls have been adjusted a moment before, and also the regularity and silence with which gear speed changes are effected, are factors which the experienced driver readily appreciates and which ease and shorten the apprenticeship for learners.—From *La Pratique*, February 10.

Rustproofing Iron and Steel—Among the many rustproofing methods, of greater or lesser value, which have been proposed in modern factory practice and tried in response to a wide demand in the automobile and other modern steel-working industries, none seems to have obviated the mysterious faculty for growth which, as is well known, a tiny speck of rust, once rooted in a body of steel, unfortunately possesses. The Bower-Barff method gives results, to be sure, but is too expensive and complicated. One of the principal requirements is that it must be possible to handle the treated article without impairing the rustproofing. Recently *The Metal Industry* her-

alded an important advance step in this matter, giving detailed account of a method patented in Great Britain by W. Coslett, an English engineer. This method does not affect the temper of tools or springs. It consists in submerging the object, for 2 1-2 to 3 hours, in a boiling solution of diluted phosphoric acid and iron shavings, after it has first been subjected for a few seconds to the action of a boiling solution of potassium or caustic soda. When withdrawn from the final bath it has an agreeable blackish appearance, which, according to a communication to the Birmingham University Metallurgical Society, is due to the conversion of the surface molecules of the object into a mixture of ferrous and ferric phosphates. This film is very resistant to atmospheric influence, but may be coated, after drying, with linseed oil or paraffin. It is not stated whether the phosphoretted film will accept copper or nickelplating, but it is recommended as a substratum for enameling or painting.

If the object to be treated is not perfectly clean and free from incipient rust, it should be pickled first, and preferably scrubbed with a soft wire brush revolving at 800 revolutions per minute. The solution of iron shavings and phosphoric acid may be prepared in a wrought iron vat heated with a Bunsen burner or by steam pipes. In England, where the admiralty has employed the method for submerged parts of vessels, the solution has been prepared in brick caldrons heated from an external furnace. For experimental work, an enameled iron kettle placed in boiling water answers the purpose. The object under treatment is best suspended by wires, to secure all-around contact with the solution.—From *La Metallurgie*, January 24.

Starting in Cold Weather—Octave Juste keeps his automobiles in an unheated garage, and the motor is often very thoroughly chilled when he wants to start out in the morning. During 15 years of automobiling he has tried many of the recommended methods for facilitating the starting of a cold motor, but has adhered to the one hereafter described, finding it the best. After opening the admission wide, retarding the spark and priming the carburetor by means of a little bicycle oiler, he injects in the air intake of the carburetor a few drops of sulphuric ether—which may be bought at any drug store. Immediately thereafter he turns the crank, and the motor starts at the second or third turn. If it does not start at the first trial, which is exceedingly rare, he increases the dose of ether and always succeeds.

His vehicle is an old Benz with surface carburetor and has been used for 12 years. The motor has a stroke of 7.3-5 inches and a bore of about 5.3-5 inches, being described as a 190 by 140 millimeters. In default of ether, heated gasoline may be injected in the same manner, but it is less efficacious and not so easily produced. He has found no dangers nor drawback to the method.—From *La Vie Automobile*, February 10.

Silicon and Electro-Magnets—It has been determined by careful experiments conducted with samples of sheet steel prepared especially for the purpose at the Schneider establishment at Creusot, France, that the alloy which is most harmful in reducing the permeability, or increasing the magnetic viscosity, of the sheet steel employed, for example, for the inductor fields in dynamos and transformers, is not carbon but silicon. The addition of 1 per cent. of silicon reduces the capacity for magnetization 3 per cent. while the unavoidable variations in the carbon content in this class of steel—these variations ranging from .29 to .35 in the experiments referred to—had no appreciable influence. From communication of February 7 by Mr. Jouaust to the International Society of Electricians recorded in *La Technique Moderne*, March 1.

Air Propeller of Steel Wire—The Siemens-Schuckert Werke Company of Berlin has secured German patent, No. 240,231, for an aeronautic propeller in which each blade is made from a bunch of steel wires flattened towards their outer ends.

Letters Answered and Discussed

Use of Parabolic Reflectors; Engine Will Not Run On Magneto; Starting a Chilled Motor; Trouble With Ignition System; How to Resilver Tarnished Reflectors

A Question of Candlepower

EDITOR THE AUTOMOBILE:

[3,073]—Could the parabolic reflectors, used for electric lighting on automobiles, be applied to the acetylene light?

If so, it seems to me that the acetylene light would give even a better light than the electric.

Inman, S. C.

F. C. C.

Parabolic reflectors are used for acetylene headlights as much as for electricity. The candlepower of the acetylene flame exceeds that of the average 6-volt lamp. According to a prominent maker of lamp reflectors the candlepower of the 6-volt bulb with a circular filament is from 4 to 24, while the Tungsten filament will run to 48. The single burner acetylene lamp will develop 100 candlepower with good pressure. The reflectors used with electric lights are generally silvered brass while those used in connection with the acetylene type are what are known as lens mirrors. In the latter the silvering is covered with a plate of crystal to protect it from the oxidizing influence of the flame. The efficiency of these two reflectors is nearly equal with a very slight balance in the favor of the more expensive lens mirror.

The Magnetic Fields Are Weak

EDITOR THE AUTOMOBILE:

[3,074]—I have a four-cylinder car equipped with a non-vibrating coil. It starts well and runs steadily on the batteries; but when switched to the magneto it stops unless the engine is running very fast. Will you please tell me through THE AUTOMOBILE where my trouble is?

Newbern, Tenn.

E. W. HARRINGTON.

The fields of the magneto are demagnetized, unless by a coincidence the spark gaps in all the plugs are far too large. Bend a plain calling card and slip it between the sparking points. This forms a good gauge for measuring the gap. Squeeze them together until they fit the folded card. If the fields are demagnetized they may be charged very cheaply at any station where electric batteries are charged. The cost will be about a dollar. It will sometimes happen that a part of the coil is short-circuited, leaving the remainder of the winding dead. This will greatly weaken the coil and can be repaired only by the manufacturer.

How to Start a Cold Motor

EDITOR THE AUTOMOBILE:

[3,075]—Having read your journal for some time, I take the privilege of offering the following suggestion for starting a motor when cold. I have tried out this idea to my own satisfaction. It is as follows:

Take a piece of tubing and place one end over a natural gas jet and the other in the air intake. Set the spark, open the throttle, turn on the gas and turn the motor over. I have not tried this on artificial gas, but it ought to work with that, too.

I never saw this idea mentioned in THE AUTOMOBILE and have never heard of its being used; but in my own experience it has proved very satisfactory. I hope that this will prove of benefit to the motoring world.

Scio, O.

F. J. CATLIN.

Trouble Lies in the Ignition

EDITOR THE AUTOMOBILE:

[3,076]—I have a four-cylinder Maxwell car, equipped with non-vibrating coil and magneto. If I give it a small amount of gasoline the engine runs entirely too fast and if I cut the gasoline down sufficiently to slow up the engine to its proper speed then I get no power at all or the engine will stop. I have tried two different carbureters and have the same trouble with each. When running slow I cannot advance my spark a notch without getting a knock. In fact, the car runs better with the spark retarded. Will you please answer through THE AUTOMOBILE?

Newbern, Tennessee.

E. T. HASKINS.

The trouble is not in the carbureter but in the ignition system. There are probably two things which are out of order, either one of which would cause the symptoms mentioned. First, the magneto is weak and does not give a good spark at low speeds. Disconnect the plug lead from the distributor and spin the motor. If there is a weak spark or none at all in the safety spark gap the fields are probably demagnetized. Revolve the armature by hand with the gears unmeshed. If the fields are in good condition the armature will offer a resistance to turning twice in a revolution. If no appreciable resistance is felt, the fields should be remagnetized.

The second trouble which has the symptoms you mention is that the timer is turned on its shaft so that the spark is always advanced farther than is indicated by the position of the spark lever. Shift the timer back a little on its axis and see if the results are not better.

Adjusting Stromberg Carbureter

EDITOR THE AUTOMOBILE:

[3,077]—I would appreciate it very much if you would inform me through THE AUTOMOBILE how to adjust a Stromberg type B carbureter.

Charlotte, N. C.

ROBERT B. COCHRAN.

Start the motor and run it as slowly as it will go steadily. Turn the knurled low-speed adjustment nut, which hangs down just above the air intake, to the left or right until the motor will run steadily at the lowest possible speed with the throttle lever closed. Now speed the motor and turn the knurled nut below the auxiliary air spring until the engine runs best at high speed. This is the high speed adjustment nut. The low speed should then be tested again. The adjustment may have to be altered slightly. Then try the motor again on high speeds, opening the throttle and advancing the spark rapidly. If it backfires when this is done turn the high speed adjustment nut up again until this ceases. If the motor smokes turn the nut down. Try the car on the road and make the adjustments in the same manner.

Strength of Manganese Bronze

EDITOR THE AUTOMOBILE:

[3,078]—Would you tell me the composition and strength of the metal known as manganese bronze? Where is it generally used? I have seen the name of the metal mentioned several times, but have never been able to find out its composition.

Mt. Vernon, N. Y.

ALBERT WHITE.

According to general practice, manganese bronze is composed of about sixty parts of copper to forty parts of zinc. A small amount of iron is generally present and a variable quantity of manganese. This metal is used in castings where strength and toughness form the requirements, such as high speed propellers.

Gear Material Not a Factor

Editor THE AUTOMOBILE:

[3,079]—I would be pleased to have you inform me as to whether it makes any material difference if a high-tension magneto is driven with steel spur gears, cast iron, or brass, one gear being located on the pump shaft and the other on the armature shaft of the magneto. I have just replaced a worn set of cast-iron gears with steel gears and would like to know if the magnetism or spark efficiency of the magneto is impaired by using steel gears.

Cleveland, O.

WM. F. KIPP.

There is no material difference in the magnetism or spark efficiency of the magneto whether it is driven by steel, cast iron or bronze gears. The magneto must be so connected, however, that it is positively driven by either gearing or silent chain. For a four-cylinder motor, the speed of the high-tension magneto is the same as that of the crankshaft, while for the six-cylinder type the magneto is driven at one and one-half times the speed of the crankshaft.

Method of Resilvering Mirrors

Editor THE AUTOMOBILE:

[3,080]—Being a subscriber to your valuable paper I wish to ask a few questions.

(1) I have built a tire pump according to the description given by E. C. Bates in your issue of October 26, 1911. I can inflate my tires with it, but I am afraid that the hot air and possibly some oil from the cylinder will damage the tires. I would like your opinion on this matter.

(2) I would like to know how to resilver the mirrors in my headlights. The backing is all flaking off.

Thompson, Pa.

C. A. LAMONT.

(1) The danger of oil reaching the tires with this pump is slight but is nevertheless present. A wire gauze screen inserted in the line of piping at some point would pick up anything of this nature. The warm air will not harm the tires as its temperature is not high enough.

(2) Some of the steps in this rather delicate undertaking are shown in the accompanying illustration. The reflector is first fastened to a block of wood by nails as shown at A. The nails are driven in lightly and the heads hold the reflector in place. A piece of emery is tacked to a block as shown at B. With

this all signs of the previous silvering are carefully removed. The emery should be of the finest kind so that scratches are not made in the surface of the metal backing. A chemists' scale of the type shown at C is secured as are also a melting pot and a thermometer capable of registering more than 212 degrees. Two ounces of lead, 2 ounces of tin and 4 ounces of chemically pure bismuth are melted together; 8 ounces of mercury are added at 212 degrees Fahrenheit and mixed with the melted mixture. This is then applied while warm with a smooth brush as shown at E.

Height of the Engine Supports

Editor THE AUTOMOBILE:

[3,081]—I would be pleased to know if there is any mathematical way of determining the position of the engine supports with reference to the axis of the crankshaft and if this could be expressed by formula.

RAYMOND WARE.

Boston, Mass.

In determining the position of the supports it is desirable to put them in the line of motion of the unbalanced forces. In this way the moments about the supporting points will be zero. In practical design, however, no mathematical formula is used owing to the fact that other considerations determine the points of support. In order to go into the subject at length it would be better if you would follow through one of the works on engine balance, using the particular motor in which you are interested as an example.

How to Make a Good Lacquer

Editor THE AUTOMOBILE:

[3,082]—How can I make a lacquer to apply to the brass on an automobile after polishing it, which will keep it bright several months?

Chatham, Mass.

C. ILSLEY SMITH.

Take bleached shellac, 60 grams; Manila copal, freshly powdered, 60 grams; gum mastic, 60 grams; absolute grain alcohol, 1 kilogram; coarsely powdered glass, small quantity. Allow to stand for 14 days, shaking frequently during that time. Add boracic acid 1 gram, filter and use. The best plan is to apply three thin coats and put them on quickly.

Six-Cylinder Firing Sequence

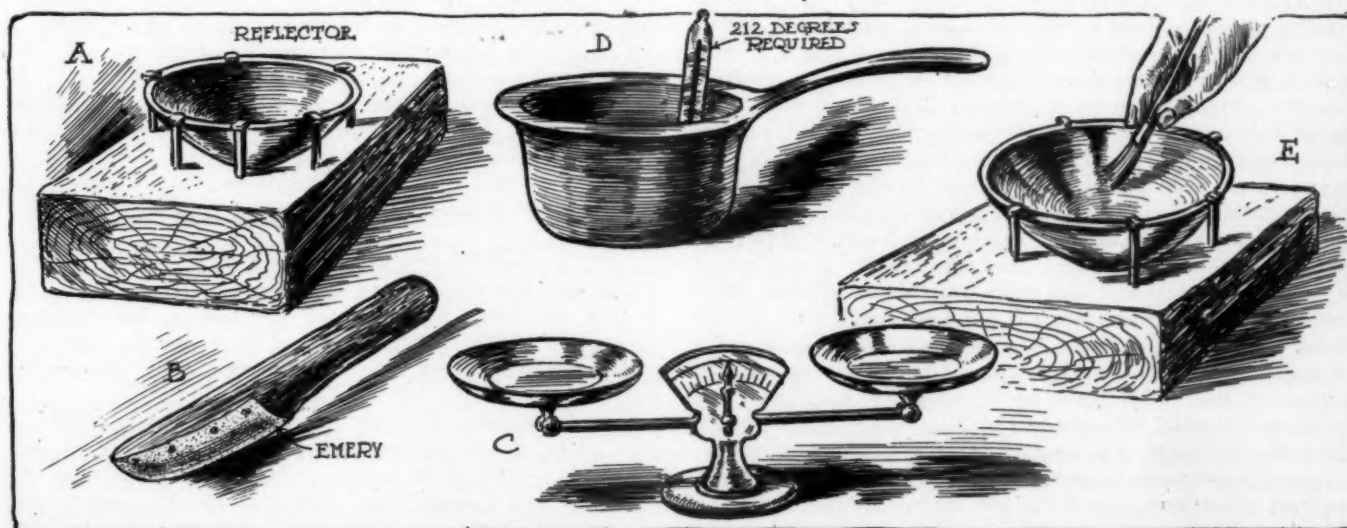
Editor THE AUTOMOBILE:

[3,083]—What is the most common firing sequence of six-cylinder motors in American cars?

CHAS. LEACH.

Paducah, Ky.

The majority of American-made, six-cylinder motors fire in this order: 1-4-2-6-3-5.



Showing some of the steps and utensils which are necessary in the process of resilvering reflectors

How to Place Your Car in Commission

Part III

Private Owners Preparations for the Coming Season; Overhauling the Clutch; Cleaning Universal Joints; Inspecting the Gearset and Differential; Cleaning the Top and Body

THE amateur delver into motor mystery has now finished with the most important part of his work. During the first two installments of this story the overhauling of the motor was taken up and the various steps tending toward the well-being of this part of the vehicle were outlined. The remainder of the car will not be found to present many difficulties.

When overhauling a cone clutch, take into consideration its action during the last time the car was driven. If this is not remembered, take the car out on the road and see if the clutch

the clutch is apt to jam completely owing to the wedge effect.

There are two reasons for a slipping leather clutch. The first and more common is that the leather has become coated with oil. The second cause is the lack of sufficient tension on the clutch engagement spring. When the clutch slips, the operator should disengage the clutch and then feel the leather. If it is damp, the trouble is that the clutch is covered with oil. The cure is to absorb the oil from the clutch leather. This is accomplished by powdering it thickly with Fuller's earth and allowing it to stand about 3 hours. A pint of gasoline poured over

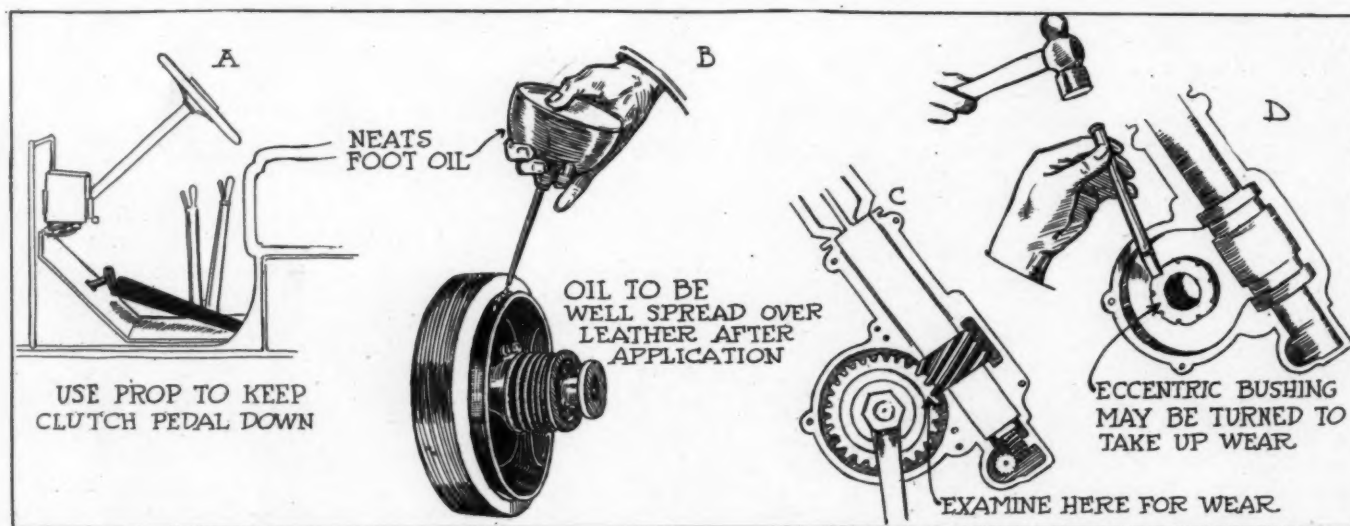


Fig. 1—Showing how to block down clutch pedal, apply the neatsfoot oil to clutch leather and take up wear in steering gear

acts as it should. If it takes up too quickly and it is impossible to start the car without a jerk, the chances are that the leather is dried out. This gives what is known as a seizing clutch. A little powdered graphite will cure this temporarily if sprinkled over the surface, but in the overhauling job it is best to fix such things so that they will give no further trouble. Block the clutch pedal down as shown in Fig. 1, at A, then fill a small can with neatsfoot or castor oil and pour it over the leather, Fig. 1, B. Spread the oil well. The leather will readily absorb it and take in all that is necessary. Leave the clutch blocked out as shown for 12 hours so the oil will have a chance to soak in. If the leather is worn the clutch will also seize. If this occurs the clutch leather should be removed. It is not advisable for the private owner to undertake to renew his own clutch leather, as, in order to make a good job, it will have to be put on tightly and the surface of the leather trued up in a lathe. One more occasional trouble which will cause a clutch to seize is that the rivets protrude. To remedy this a center punch or a nail punch should be placed against the rivets and they should be hammered until they are about 1-16 inch below the surface of the leather so that there is no possibility of any metallic contact between the clutch seating and the rivets. If the rivets project very much

the clutch leather will also soak up the surplus oil. When the slipping clutch is caused by the weak pressure of the spring, it will have to be remedied by changing the adjustment. If there is no adjustment nut on the spring, the pressure may be increased by placing a washer between the spring and its seating. This will tend to compress the spring and to push the clutch into a closer engagement. In case the spring seems weak or defective, so that changes of adjustment do not suffice, the owner of the car should send to the factory for a new spring.

Clutch Leather Must Be Inspected

If the road test did not bring to light any defects so far as slipping and seizing are concerned, it would be wise to look at the surface of the leather and see if there are any humps or grooves which are worn upon it. If so, they should be removed with a rasp.

With the multiple-disk clutch, only insufficient lubrication can cause harm. In overhauling, remove the clutch. This can generally be taken from the car as a unit. It should then be disassembled and washed bright with kerosene, thoroughly oiled and replaced. Next, sit in the driver's seat and test the pedal to determine if it is in the correct position for comfortable driv-

ing and easy manipulation. If it is not, it should be adjusted by loosening the nut on the base of the pedal and putting the latter in the proper position. The nut is then tightened. On some of the newer forms of pedals the nut will be found immediately beneath the foot-plate.

The universal joints in the driving mechanism may now be taken up. Remove the leather boots, if any are provided, and clean them with gasoline. In most cars the housing inclosed by the leather boot is a small, cylindrical sleeve held by four set-screws. When these are removed the sleeve may be slipped off the universal joint, leaving this free to be cleaned. All signs of the old oil should be removed and new grease put in. The kind of grease recommended by different car makers varies, but the oil known as timing-gear oil, having a consistency between heavy cylinder oil and vaseline, may be used. Graphite grease is also very good. In some of the more inaccessible universal joints it will be safer for the amateur to merely renew the grease without attempting to disassemble the housing. Should a knock or rattle develop, it is a case of disassembling and re-bushing the joint and is therefore out of the scope of the amateur unless he has an exceptional shop.

Gearset Presents Few Difficulties

The gearset should not present any difficulties in overhauling if the car has been properly driven. On the other hand, if there is anything the matter it will probably be in the line of chipped or stripped gears which will have to be cared for by a service

Brake linings should never be allowed to become worn out. At the beginning of the season they should be most carefully inspected. Too much depends upon them to allow them to be materially reduced in efficiency. If they have a worn appearance the fabric should be replaced immediately. The old material is removed by punching out the old rivets. If this work is carefully done the old material will be sufficiently preserved to form a pattern by which to cut the new strip. Most supply stores carry brake linings but if none is at hand a strip of the correct size may be secured from the manufacturer of the brake if the diameter and width of the brake drum are furnished him. One of the best preserved of the old rivets should be taken as a sample for the size of the new rivets which may be purchased at any well-stocked hardware store. The strip of brake fabric is then laid over the shoe which is to carry it and put in the correct position, being careful to stretch it tight. A pencil is then passed through the rivet holes and the marks made upon the fabric in this way will serve as a guide in punching the holes through the fabric. These are now punched by means of a hammer and a large nail if a regular leather punch is not available, and the rivets are passed through, with the heads on the fabric side, and hammered over. They should be driven 1-16-inch below the surface of the fabric so that there will be no danger of a metal-to-metal contact between the rivet heads and the brake drum when the brake is engaged.

The brake adjustment should be examined next to see if the shoes are in contact with the drums when the brakes are not in



Fig. 2—Where to take up play in front wheels, how to get rust from rims of wheels, and some steps in cleaning top and body

plant. The first step in the overhauling is to remove the plug from the bottom of the gearbox and allow all the oil to drain out. Then take the cover off the casing and thoroughly flush the gears with kerosene. When this has all drained, inspect the gears and if they are in good condition refill the housing with fresh transmission grease. Do not use waste in the gearbox under any circumstances as the damage that may result from the lint which is sure to be stripped from the waste may be serious.

The method of procedure with the differential is very much the same as that used in connection with the gearbox. The old oil is drained out by removing the drain-plug at the bottom of the casing. The interior of the casing is then flushed out with kerosene. If there is a noise in the differential which can be traced to wear between the drive pinion and the differential bevel this may often be taken up. On some cars a large nut will be found between the rear universal joint and the drive pinion for this purpose. It would be advisable before making any adjustment here to write a letter to the makers of the car stating the year in which it was made and asking instructions as to how to proceed, as this part of the structure varies in different makes of cars.

use. This can generally be determined while the car is jacked up by rotating the wheels and noting the resistance. The scraping action of the brakes will be felt if they drag. Another way in which dragging brake shoes may be detected is to take the car out on the road and, while the car is running, stop the motor to eliminate its vibration. Before the car has lost its momentum, throw out the clutch and lightly place the foot on the brake pedal and the hand on the emergency brake lever, being careful not to move either. If the brakes drag, the driver will be able to feel the resulting vibration in the pedal or lever according to whether the dragging shoe is in the service or emergency brake set.

How Dragging Brakes are Cured

The cure for dragging brakes consists in increasing the tension on the drag spring which is fitted to all brakes for the purpose of keeping the shoes away from the drums when the brakes are not required. A simple nut and locknut generally form the means of tension adjustment. One more brake feature which should be examined every month when the car is in frequent use, is the adjustment of the rods connecting the pedal with the brake. There should be practically no lost motion of the pedal

before the brakes begin to take hold. This adjustment will be readily found by following the linkage of the brake rods from the pedal back to the brakes. It is generally located at the front of the long rod connecting the pedal or lever with the equalizing bar. A turnbuckle, nut or wing nut is utilized for this purpose.

Play in the rear or front wheels can be found by jacking up the car, grasping the rim and working the wheel laterally. If the wheel shows looseness the adjustment nut should be turned to the right. This nut is located within the hub cap and whatever its shape is made so that a slight turn makes a considerable change in the adjustment. Do not have the wheels too tight, but turn the nut until the wobble disappears. In Fig. 2 one form of adjustment nut for the front wheels is shown. In case of ball bearing wheels it would be well to take out all the balls and examine them for wear. If any signs of wear are found, replace the worn balls at once. The ball races should be carefully cleaned with gasoline and freed from the slightest suspicion of grit. The same attention as regards cleaning should be given bearings.

Test the Alignment of the Wheels

The alignment of both pairs of wheels may be tested next. This may be done by taking a measurement between the centers of the two wheels at a height of about 18 inches from the floor. The wheels are then rotated and at several different points on the circumferences this measurement is taken across the two wheels. It should be the same at all points. If it is not, the car should be taken to a repair shop and the alignment corrected. The bent member will probably be the axle although the steering knuckles may be at fault in the front wheels.

The steering gear will need a thorough oiling. If there is too much backlash, that is to say if the steering wheel does not act instantaneously but has a certain amount of lost motion, this will have to be taken up. The manner in which it is accomplished is shown graphically in Fig. 1. The cause of the backlash is generally the wear shown at C, between the worm and the sector or gear. This may be adjusted by dismounting the steering assembly and turning the eccentric bushing shown at D, which holds the sector or gear. This will bring the latter into closer engagement with the worm and the play will be eliminated. All the steering gear connections should be examined and cleaned with kerosene. All the bearings throughout the steering gear should be lubricated and after the car has been overhauled this should be done every day except when grease cups are fitted. These should be refilled and given a turn every day. The steering ball socket casings are often fitted with leather boots in the same way as the universal joints. This protects them from dust and is very good practice. If it is desired to fit boots at these points soft pieces of leather are secured and cut so that they will fit around the steering ball socket casings with openings for the drop arm or cross rod and also spaces for the grease cup spindles. They are then pierced to take the lacings which hold them in place. Use rawhide lacing.

Removing the Rust From Rims

The tires should be removed and the rims cleaned. If demountable rims are used the bolts and nuts and all the other metal parts should be freed from rust by the use of fine emery cloth. A rounded piece of wood such as is shown at B in Fig. 2 with a piece of emery tacked to it is very useful in getting into the inaccessible spots. After all the rust has been removed two coats of shellac may be applied to the rims for their protection.

Inflate the inner tubes and dip them in a pan of water. Bubbles will indicate the leaks. If any develop they should be vulcanized. It must be remembered that patches are merely temporary repairs and the owner should not regard them as permanent. Surface cuts on the casings should also be vulcanized so that the life of these be prolonged as much as possible.

Vacuum cleaning is advisable for the upholstery if such a cleaner is available. The upholstery will be greatly rejuvenated

by this method of cleaning for the dirt below the surface will be drawn out. If a vacuum cleaner is not handy, the best method to employ would be a very stiff short-haired brush. A little gasoline will be found very efficacious for the spots.

The method of getting at the body and top is depicted in Fig. 2 at C. If the top is of mohair, a pail of tepid water and a bar of castile soap should be secured. Place the soap in the pail of water and work with the hands until a good lather is obtained. A large clean sponge is then dipped into the water and the top thoroughly washed. If the top is very dusty it would be well to use a broom briskly first, as this will make the subsequent labor with the wet sponge much easier. After the top has been thoroughly cleaned with the soap and water it should be gone over again with clear water so that there will be no danger of alkali spots appearing after the top is dry.

Buffed leather tops have the great disadvantage of becoming very bad-looking when the enamel is broken up. If the top is in this condition the owner will no doubt wish to do something to restore its appearance before he takes the car out. A very good dressing for this purpose is according to the following recipe: One part of liquid asphaltum to two parts of castor oil, to which is added 1-2 ounce of ivory black to each pint of the mixture. Apply this with a soft brush. This dressing is excellent also for a rubber top which has become battered. These dressings are not to be applied until after the top has been washed.

Pantasote tops will be found to need very little in the way of freshening up if they have been carefully tended to during the season. Brushing occasionally with a stiff broom will do wonders. If the surface of the Pantasote begins to look dried-out and parched, a transparent liquid dressing which dries off without leaving a greasy appearance should be employed. If the owner does not stint himself as to the price of the dressing he will be wise. Never use gasoline on any top, as it will dissolve the gum layer between the cloths.

Care Necessary in Cleaning Body

If there is an accumulation of dirt on the body when the overhauling is undertaken, wash it off with a gentle stream from a hose. For removing the grease a sponge with castile soap and tepid water should be used. Do not attempt to rub the dirt from a body but soak it off with plenty of water, being careful not to use a strong stream of water. Neither extremely hot nor extremely cold water should be used. After having washed the body, it should be gently dried with a piece of clean chamois skin. Should varnish be required on any parts it may be made up as follows: 3 ounces oil of citronella, 1 1-2 ounces oil of cedar, 1 pint paraffin oil, 1 gallon turpentine. Apply this with soft, clean cotton waste and rub dry with a clean flannel cloth. After this allow the car to stand for as long as possible in the sunlight but protected from wind.

Explaining the Elmore Cycle

Our attention has just been called to an error in the issue of January 25, page 311. It was stated that the Elmore motor used crankcase compression whereas the Elmore cycle is as follows: When the piston is at the bottom dead center of the stroke, a charge of gas is admitted by means of a rotary distributor into the upper portion of the cylinder. The cylinder raises, compressing the gas, at the same time the lower half of the piston pumps a charge of explosive gas into the rotary distributor. The cylinder fires, and at the bottom of the stroke the burned gas is expelled by the incoming charge admitted to the cylinder by means of the rotary distributor. This action of necessity must be alternate. In other words, the pump portion of No. 1 cylinder forces the charge of explosive gas through the rotary distributor into the firing chamber of No. 2 cylinder. The pump cylinder of No. 2 cylinder forces the charge into the explosive chamber of No. 1 cylinder—this operation, or cycle, being repeated each revolution of the engine.

The Ideal Automobile for 1913

Some of Our Readers' Conceptions of What Next Year's Car Should Be

Suggests An Aerial Propeller Drive

EDITOR THE AUTOMOBILE:

I am quite interested in readers' accompanying letters, views and drawings of their ideal cars. I have noticed that they all, so far, have followed the same general design and construction of the manufactured cars of today.

I take the liberty of sending drawings and explanations of my proposed car. It is not exactly my ideal car, but it may revolutionize the automobile problem of the future as far as light weight and minimum number of parts is concerned, and also make shifting of gears, which is a complicated operation, a thing of the past. It is an automobile driven by an aerial screw or propeller. This type of machine has been tried out, and, it is claimed, has attained the speed of 55 miles an hour.

A car of this design if properly made should easily attain a speed of 80 to 100 miles an hour. I have designed, as I think, a car that will reduce head resistance and the vacuum at the rear to a minimum.

The construction of such a car should be of extreme lightness and strength. Wire wheels with an aluminum body are used in the construction as far as possible. There are no gears nor heavy transmissions, very little air resistance and consequently it will be a very light and speedy car. Two light tubular axles, frame, motor and propeller are about all there is to the car. The motor could be of any standard make today developing about 30-35 horsepower and of fairly good speed. A clutch between the motor and propeller is all that is necessary so that the motor may be left running when the car is standing.

I would say that the propeller be about 6 1-2 feet in diameter with a very heavy pitch. This car would have one set of brakes acting on the rear wheels, also a small brake on the propeller shaft to keep the propeller from whirling when clutch is out.

However, it would be extremely dangerous to take curves at high speed on account of skidding. I have helped to eliminate this by placing a vertical fin in the rear to keep it in a straight course. This also acts as a wing for the wind to bank against, which helps to reduce skidding on turning corners.

I think the car should be built to sell for \$1,250 or \$1,500 with a reasonable profit to its manufacturers.

Chicago, Ill.

B. HARRISON HOWE.

Thinks Easy Riding Sine Qua Non

EDITOR THE AUTOMOBILE:

I have some definite opinions on the subject of the ideal car, which I feel differ materially from many of those hitherto set forth in your columns.

In the first place, my car should be large enough to care for my entire family, which is seven strong. The mechanical details of its construction do not appeal to me so strongly as do its possibilities for comfortable touring. Of course, to be ideal, there should be no fault with any part of the mechanism, and the most advanced ideas in automobile engineering should be followed.

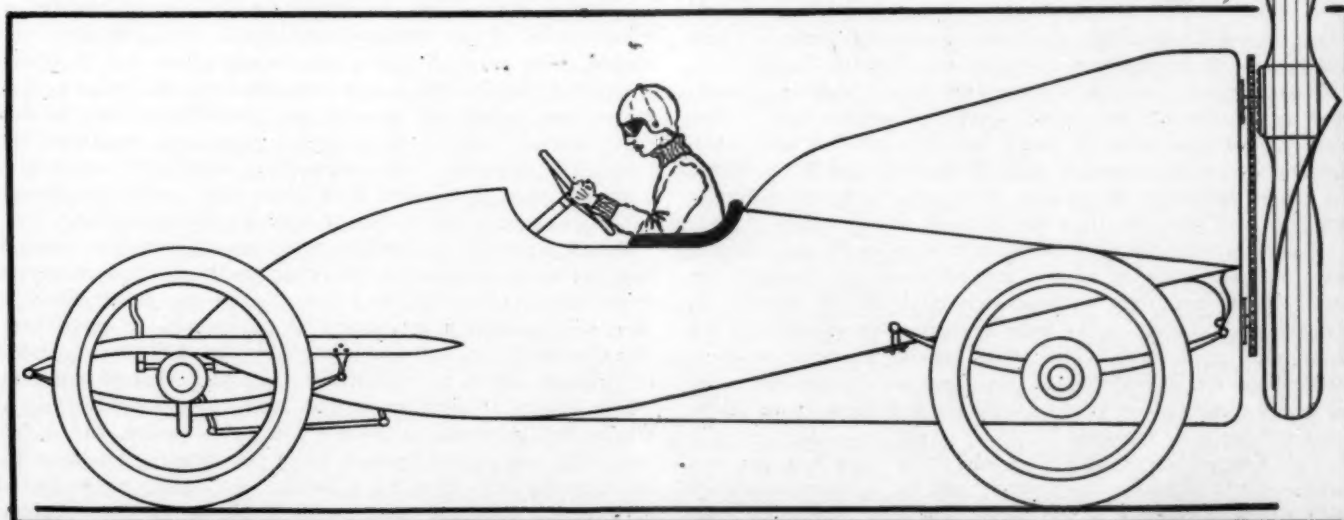
The motor should have sufficient power to get the car over any sort of a hill without great effort—about 60 horsepower would be enough, I think. There should be a large radiator and there should be a positive water circulation system, so that all possibility of overheating under heavy load would be eliminated.

Springs and car suspension are very important. The springs should be very long and of the three-quarter elliptic variety, both front and rear. This type of spring in my opinion gives most resistance to road shocks. In addition to this manner of suspension, there should be shock absorbers of a design not yet brought out. I do not know how they should be designed, but I am sure of the results which should be obtained from their use. The occupants of the car, in other words, should not be able to distinguish between the very roughest roads over which they travel and the very smoothest, so effective should the absorbers be. No one has yet devised a shock-absorbing outfit which would meet these requirements, although some of the later ones come very near to it.

Every luxury and device which would in any way add to the comfort of the car's occupants should be included in the equipment. The car would cost quite a lot of money, but why not have what you want in your ideal? It costs no more for perfection in one's ideals than for mediocrity. Too many of your readers appear to be satisfied with a cheap car. Ideals are not so easily attained, in my opinion.

Denver, Col.

HOMER G. BRADLEY.



The car of the future, according to B. Harrison Howe, of the Windy City

Automobile Metallurgy Made Easy

By E. F. LAKE

XIX—Titanium Steel

Addition of Titanium Increases the Tensile Strength and Elastic Limit of Steel

TITANIUM steel is fast growing in favor for automobile use. It derives its name from the fact that the metal titanium is used to still further purify the bath of molten metal, after all of the other elements have been added and the work of the steelmaker practically finished. It is the newest of the alloy steels and has been in use but a few years. The first heat that was made in America was poured in 1907, but since that time its progress has been such that the output of titanium steels is now greater than the combined output of all other alloy steels. It increases the cost of the metal less than \$1.50 per ton and adds properties that cannot be obtained with any other alloying material.

Titanium belongs to the same chemical group as silicon. There is a considerable quantity of it in the earth's crust and in many parts of the world it occurs as a natural ingredient of iron ore. Here, however, it has been a detriment to steelmaking, principally because of its action on the lining of furnaces, which are quickly burned out when titaniferous ores are used.

The electric furnace with its high heat has made it possible to separate the pure titanium from its ore and combine it with iron. This ferro-titanium contains from 12 to 15 per cent. of titanium, about 6 per cent. of carbon and 5 per cent. of all impurities. In this form it can be added to the molten metal while making steel. It then enters into almost instant solution, and its action is made very beneficial. It is seldom that more than 1-2 of 1 per cent. of titanium is thus used in the steel.

Titanium is the only undisputed example of the combustion of an element in nitrogen. When heated in oxygen it creates an instantaneous dazzling flame. These properties show that it will affinitize readily with oxygen and nitrogen and carry them to the slag that covers the top of the molten steel. It thus reduces the amount of gases that would otherwise be occluded in the steel, or be present in the injurious form of microscopic bubbles, or the larger blowholes, and also the oxides, nitrides, etc., that they might form with other elements. These two elements are present in larger quantities than has previously been recognized and they have proven to be more injurious to steel than phosphorus or sulphur. While nickel, chromium, vanadium, tungsten and other elements add certain good qualities to steel, none of these combines with the nitrogen or removes it from the metal.

When oxygen comes in contact with iron it forms an oxide, and this forms into very small specks throughout steel. They can only be seen when the metal has been polished and examined under a microscope that magnifies at least 1,000 times. These, of course, interrupt the cohesive force that holds the molecules together and thus decreases the strength of the metal.

Recent investigations of twenty-four samples of steel showed that the percentage of oxygen ranged from 0.021 to 0.046 per cent., which may seem so small that it should be ignored, although steels containing the same amount of phosphorus are not considered good steels. The actual amount of any element in steel, however, should not be the important consideration, as it is the combinations that such an element forms with others that are the most essential.

For instance, we speak of the sulphur as being 0.05 per cent. whereas it is in reality the 0.13 per cent. of manganese-sulphide that affects the quality of the metal; this being one of the combinations that is formed by sulphur. Oxygen only has half the atomic weight of sulphur and when we speak of 0.05 per cent. it

corresponds to 0.22 per cent. of ferrous oxide, and this very materially weakens steel. When titanium is put into the molten metal it rushes to the oxygen, and combines with it in the form of an oxide that is

lighter than molten steel. It then raises it to the slag before it has a chance to combine with the iron, in the form of the injurious ferrous oxide.

Titanium forms with nitrogen a nitride, that shows as tiny red crystals under the microscope, and raises this to the slag. Recent investigations have shown that each increase of nitrogen in steel causes a reduction in its ductility and a rapid decline in the elongation. Practically speaking, its elasticity has disappeared when the nitrogen content reaches 0.035 per cent. and the metal becomes absolutely brittle. Steel containing 0.50 per cent. of carbon loses its ductility in the presence of 0.045 per cent. of nitrogen. In a 1.00 per cent. carbon steel the elongation and contraction become *nil* when the nitrogen content reaches 0.035 per cent., while in very low carbon steels this may not occur until 0.08 per cent. of nitrogen is present.

The nitrogen content of Bessemer steels runs from 0.018 to 0.062 per cent.; open-hearth from 0.020 to 0.025 per cent. and crucible steels from 0.010 to 0.015 per cent. Steels made in the resistance electric furnaces are practically free from nitrogen, but those made in the arc electric furnaces are liable to contain injurious amounts. By treating such steels with titanium, the nitrogen is reduced to from 0.004 to 0.005 per cent.

A practical example of the results obtained by adding titanium to steel was shown by a test of some Bessemer structural steel, which before treating had a tensile strength of 67,000 pounds per square inch; an elastic limit of 42,000 pounds; an elongation of 24 per cent., and a contraction of 40 per cent. After this same metal was treated with 1-2 of 1 per cent. of titanium, the tensile strength was increased to 77,100 pounds per square inch; the elastic limit to 51,700 pounds; the elongation to 25 per cent., and the contraction to 43 per cent.

Another heat of titanium-treated steel that was rolled into rods 1-4 inch in diameter gave a tensile strength of 114,400 pounds per square inch; an elastic limit of 91,000 pounds; an elongation of 28 per cent. and contraction of 52 per cent. Ordinarily from 90,000 to 95,000 pounds per square inch in tensile strength is the best that can be obtained from this material. The 20 per cent. increase in strength was doubtless due to the fact that titanium removed the occluded gases and slag from the steel. The amount of slag rising from a titanium-treated steel is greater than that raised from steels that are not so treated, which also proves that it aids in removing the impurities.

Tensile strengths of from 200,000 to 275,000 pounds per square inch are easily obtained in the better grades of titanium-treated steels that are properly heat-treated, and the elastic limit of these will be between 175,000 and 250,000 pounds per square inch. The elongation and contraction are also high, while the resistance to torsional and vibrational strains is equal to that of any steel.

The ability of titanium-treated steel to withstand torsional strains was shown by a piece 1 1-8 inches square, and 4 feet long, that was twisted through seven complete revolutions without showing any signs of a break. Its ability to withstand abrasive or frictional wear is well shown by the titanium-treated Bessemer steel rails that have been put into use on the various railroads. These have worn four and five times as long

A Calendar of Events

Shows

- March 25-30.....Indianapolis, Ind., Annual Show, University Park, Indianapolis Automobile Trade Association.
 March 27-30.....Waterbury, Conn., Annual Show, Auditorium.
 March 29-30.....Geneva, N. Y., Annual Show, State Armory, Geneva Automobile Club.
 April 6-13.....Ottawa, Que., Annual Show, Howitch Hall, Ottawa Valley Motor Car Association.
 April 8-13.....Oswego, N. Y., Annual Show, Company D, Armory.
 April 29-May 4.....Burlington, Vt., Annual Show, State Armory, Burlington Merchants Protective Association.
 July 10-20.....Winnipeg, Man., Canadian Industrial Exhibition.
 Sept. 23-Oct. 3.....New York City, Rubber Show, Grand Central Palace.

Race Meets, Runs, Hill Climbs, Etc.

- April 13.....New York City, Truck Parade, Motor Truck Club.
 April 27.....Philadelphia, Pa., Annual Roadability Run, Quaker City Motor Club.
 May 4.....Santa Monica, Cal., Annual Road Race, Motor Car Dealers' Association.
 May 14-17.....Chicago, Ill., Commercial Vehicle Test, Chicago Motor Club.
 May 30.....Indianapolis, Ind., Speedway, 500-mile race.
 May 30.....Salem, N. H., Track Races, Rockingham Park.
 June 30.....Algonquin, Ill., Annual Hill-Climb, Chicago Motor Club.
 Aug. 8-10.....Galveston, Tex., Beach Meet.
 Aug. 23-24.....Elgin, Ill., National Stock Car Races, Chicago Motor Club.
 Sept. 2.....Indianapolis, Ind., Track Races, Speedway.
 Oct. 5.....Philadelphia, Pa., Annual Fairmount Park Road Race, Quaker City Motor Club.
 Oct. 7-11.....Chicago, Ill., Reliability Run, Chicago Motor Club.

Foreign

- June 25-26.....Dieppe, France, Grand Prix de France, Automobile Club de France.

as the ordinary Bessemer rails and would indicate that the life of gears might be increased by the use of titanium in steel, as these get practically the same rubbing and sliding effect that is given by a car wheel running over a rail.

Titanium steels have a great resistance to the vibrational strains that are given nearly all parts of an automobile. This is well shown by a test conducted on a White-Souther rotary vibrational testing machine, with an open-hearth steel containing 0.25 per cent. of carbon. With no titanium this steel withstood 2,660,000 revolutions at a fiber stress of 38,870 pounds and then broke. When the same metal was treated with titanium it withstood 4,052,200 revolutions at the same fiber stress, and 13,725,600 revolutions at higher fiber stresses, before it broke. This made a total of 17,777,800 revolutions for the titanium-treated steel as against 2,660,000 revolutions for the same steel before the titanium was added.

On this account a prominent springmaker has made a specialty of titanium steel for automobile springs, as such tests would indicate that they are eminently fitted to withstand the alternating vibrations that springs receive when in use.

The output of ferro-titanium was at first absorbed by the railroads, owing to the extremely good wearing properties that were shown in rails when the steel was treated with titanium, but the output has been increasing to an extent that now permits its use for other purposes, and consequently it is rapidly being applied to the finer grades of steel that are used for automobile purposes. As it increases the tensile strength, elastic limit, contraction, transverse strength and ductility of steel, and greatly improves its resistance to vibrational, torsional, shock and impact strains, and also improves its resistance to frictional or abrasive wear, titanium steel is destined to prove a valuable addition to the materials used in the manufacture of motor car parts. Some manufacturers have commenced to use it for crank- and camshafts, connecting-rods, and other moving and wearing parts of the power plant, as well as for the driving shafts, gears, axles, steering knuckles and other important parts. As its cost is but slightly in excess of carbon steels that are made by the same process, it might become popular for the various parts of the frames, axle housings, brake drums, etc., owing to its resistance to vibrational strains.

Harking Back a Decade

From *The Motor Review*, March 27, 1902.

The next automobile show will be held in New York during the third week of January, 1903, at Madison Square Garden. It will be given under the auspices of the Automobile Club of America and the National Association of Automobile Manufacturers, which will be joined in management by the Madison Square Garden Company. Notice to this effect has been sent out by Secretary Samuel M. Butler.

The first prize for roller speed with a gasoline automobile at the recent exhibition at the Coliseum, Chicago, has been awarded to R. D. Chapin, who drove an Oldsmobile 1 mile in 1:46 3-5. The steam car that competed made the mile in 53 seconds.

The Cocks automobile bill, heretofore described in these columns, has passed both houses of the legislature and will be sent to the Governor.

Cleveland now has the distinction of being the home of more automobile companies than any city of its size in the country. The Winton Company has just announced that it will commence building a vast addition to its factory, a one-story building 900 by 100 feet, where 1,000 men will be employed. It is proposed to turn out ten cars a day, or three times the present daily output.

A bill has been introduced in Congress by Representative Otey, of Virginia, to appropriate \$100,000,000 for the building of good roads.

The Paris-Vienna road race has been abandoned, according to mail and cable advices. The reason for its abandonment is said to be the refusal of the Bavarian government to consent to allowing the race to pass through that country.

Ground has been broken for the addition to the Stearns factory at Cleveland.

The young American Automobile Association has mapped out a campaign which no doubt will be actively prosecuted under the leadership of its energetic president. The movement is commendable and we wish it all success.—*Editorial*.

There is a good deal of hard business sense in the action of one of the makers of automobiles who sent six men to the Chicago show for a visit of inspection. The sextette included two office men and the heads of the departments of machine, body, painting and trimming. Now that the idea has been suggested, it is likely that others will adopt it at future shows.—*Editorial*.

Alden B. Sampson has established at Pittsfield, Mass., a first-class automobile repair shop which is so large that he may undertake manufacturing.

Henri Fournier says that in future he will participate in no race of less than 100 miles. He states that any shorter distance is no test for a modern automobile.

Edward Russell Thomas, owner of the White Ghost, formerly owned by William K. Vanderbilt, is offering the monster 40-horsepower automobile for sale at \$4,000.

Black and Gold Varnishes

A black varnish for covering leather and which can be roughly handled without fear of breaking, is made up in the following manner: Mix 30 parts of rosin with the equal quantities of turpentine and turpentine oil; add 60 parts of sandarak gum and 120 parts of shellac, after which dissolve the whole mixture in 900 parts of alcohol of 90 per cent. Filter the liquid through fine linen and then mix it thoroughly with 15 parts of fine lamp-black which has been dissolved in a little alcohol.

A good gold varnish is made in the following manner: A suitable quantity of shellac is dissolved in the same weight of concentrated alcohol. To this solution is added a 0.5 per cent solution of boric acid in alcohol, which gives the varnish its consistency. However, the varnish made in this manner is colorless, and in order to produce a golden shade picric acid is added until the desired degree of yellow is reached.



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 Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903,
 and the Automobile Magazine (monthly), July, 1907.

Muffler Cut-Out Value

IS the muffler cut-out worth while?

Many are trying to settle this question; last week the Touring Club of America initiated an active campaign in this work by having official tests made. In these tests, reported in THE AUTOMOBILE a week ago, it was proven that with an adequate muffler there is very little loss of horsepower due to it. The test figures showed a loss of .5 horsepower at 300 revolutions per minute; a loss of 1.5 horsepower at 1000 revolutions per minute, and a loss of .75 horsepower at 1800 revolutions per minute. The other figures show the range of horsepower loss between these speeds.

These facts are worth studying; they are referred to the driver who thinks he cannot accelerate without opening the cut-out, and who when he opens the cut-out disturbs the entire community. These figures are a positive answer to this type of driver. Heretofore many figures have been given out showing more or less amazing loss of power due to mufflers. Many of these figures are now four or more years old and during the interim much progress has been made in the manufacture of mufflers. As it stands today the motor is practically as efficient when the muffler is in use as when not in use or with the cut-out open.

Several cities have legislated against the use of the muffler cut-out because of its noise. This anti-noise legislation is meeting with general approval, and agi-

tation for similar legislation should be started in New York and other large cities where the muffler cut-out nuisance is permitted.

Several manufacturers have worked consistently against the use of the cut-out for several seasons. One or two makers refused to make the cut-out a part of standard equipment, because of the abuse it was subject to. These makers did not want the name of their car associated with such needless noise-creating nuisances. The course was a wise one.

There are several legitimate uses of the cut-out: Its brief use to determine if all cylinders are firing is excellent; its short use on dangerous parts of country roads is satisfactory, although there are special signals that give better service; and for city driving it is often very convenient to use it when approaching a crossing. The good uses have been forgotten in the avalanche of abuse.

* * *

Decade's Enormous Gain

THE report of the chief statistician of the Federal Government, which is digested on other pages of this issue, brings out in unmistakable language the phenomenal progress made in the motor car industry in the decade from 1899 to 1909. During this period the automobile industry has outdistanced all others in the enormous increase in the value of its products, and also in the enormous increase in the number of people engaged in the industry. Such increases are natural. The opening days of the twentieth century saw the birth of the automobile industry. It is but natural that a young industry should show unprecedented development, particularly an industry which appeals to such a vast majority of the people as the automobile does.

When it comes to analyzing the figures of increase it is almost impossible to reconcile the percentages of gain with those in the other industries. In the matter of increase in the value of products, the automobile industry shows 5,148.6 per cent. increase during this decade. The next industry in point of percentage increase is copper, tin and sheet iron with a gain of 155 per cent., which is far below that of the automobile industry. The statistics show that there are thirteen industries which show an increase of over 100 per cent. in this decade, these industries in the descending order of increase being: Automobiles; Copper, Tin and Sheet Iron; Cotton Seed Oil; Women's Clothing; Electrical Apparatus; Copper Smelting and Refining; Bread; Confectionery; Gas, for lighting and heating; Distilled Liquors; Paper and Pulp Wood; Butter, Cheese and Condensed Milk, and Knit Goods.

It is but natural that where an industry shows such an amazing increase in the value of products there should be a corresponding increase in the number of wage-earners. The statistics show that although the increase in value of products in the automobile industry is 5,148.6 per cent., yet the increase in the number of wage-earners is but 3,278.9 per cent. The story in these comparative figures is the tremendous progress made in reducing the cost of manufacture in the automobile industry. It is questionable if there is any other industry today in which there have been such strides of progress made in multiple manufacture, and in the design of special machinery for manufacture as in the automobile industry.

Would Open Yellowstone Park

Idaho State Automobile Association Urges State Legislature to Petition Congress to That Effect

POCATELLO, IDAHO, March 23—The Idaho State Automobile Association has taken up the cause of the Bannock County Automobile Club, and at its second annual convention held in Pocatello, a strong resolution was passed recommending to the state legislature that it prepare a suitable memorial to Congress, asking that it adopt such rules and regulations as will hasten the opening of Yellowstone National Park to all motor-driven vehicles under proper restrictions.

The association also put itself on record as being in favor of a north and south highway through the eastern portion of the state, thereby connecting the adjoining states with the Yellowstone park. A sand road about 5 miles in length across the Indian reservation in Bingham and Bannock counties has been almost impassable, even for horse-drawn vehicles, and last year the state legislature appropriated \$20,000 to macadamize it. This sum was insufficient, and the Idaho State Automobile Association, through some of its members, has pledged itself to raise \$15,000 by voluntary subscription to complete the road. The association also passed a resolution recommending to the legislature that sufficient appropriation be made to reimburse those who advanced the necessary funds for the immediate completion of the road. It is the desire of the state association that the road be made ready for automobile travel this year.

A hill climbing contest at Shoshone Falls in July under the auspices of the Twin Falls County Automobile Club was endorsed by the state association. Preliminary steps were taken for an Idaho Good Roads tour in June, the start to be at Pocatello and the finish at the Inter-Mountain Goods Roads Association convention at Logan, Utah. A semi-annual meeting and outing was called for August 6 at Montpelier, and the annual convention will be held at Idaho Falls next spring.

The officers selected for the ensuing year are: President, Theodore Turner, Pocatello; first vice-president, G. C. Gray, Montpelier; second vice-president, L. B. Murphy, Idaho Falls; secretary-treasurer, Robert W. Spangler, Twin Falls. Two new clubs, Blackfoot and Idaho Falls, were elected to membership. A banquet to fifty delegates was served by the Bannock County Automobile Club.

Object to Economy in Road Building

DAVENPORT, IA., March 23—The Davenport Automobile Club and Scott County motorists are expressing discontent over the recent action of the Scott County board of supervisors in deciding that road construction work during the coming season is to be limited in every degree possible and that the most rigid economy in this line is to be practised. This action is brought about by the decreased income of the county, due to the flat mill tax on moneys and credits and to the limiting of saloons in the county by a recent supreme court interpretation of the Moon law.

Subscribe to Build New Road

NEENAH, WIS., March 23—A movement is under way in the Fox river valley of Wisconsin to build a macadam highway connecting the principal cities at private expense. Motor car owners have been asked to subscribe \$10 each. The proposed highway will be 7 miles long and start at Neenah-Menasha, the twin cities at the head of Lake Winnebago, running to Appleton.

Arcadia Highway Open May 23

St. Louis Motorists Are Preparing to Dedicate the Prettiest 100-Mile Road in the Country

ST. LOUIS, MO., March 25—St. Louis will be fortunate shortly in owning one of the prettiest routes for a 1-day automobile trip in the whole United States, when on May 23, the new Arcadia Highway is dedicated.

The road covers a distance of about 100 miles. It runs south from St. Louis through some of the most famous historical and scenic territory in the country. Part of the route, in fact most of it, is right through the heart of the Ozark Mountains. The terminus of the road is the Arcadia Country Club where a number of rich St. Louisans have country homes.

From St. Louis the road goes to De Soto and then to Bonne Terre, Flat River and Doe Run where the St. Joseph Lead Company has the biggest lead mines in the country.

F. P. Graves, a retired mining man at Doe Run, has one of the largest collections of minerals and of relics in the whole world.

Iron Mountain, one of the next points of interest on the road is famous because it gave the name to the Iron Mountain Railroad. The village is deserted now. In the fifties it was, literally a bee-hive. Iron was mined there then in large quantities.

At Fort Davidson, a hole in the ground now, General Price had his Confederate troops at the beginning of the Civil War and they followed a large part of the present highway to the north. Graniteville is known because of the immense granite quarries there.

The Arcadia Country Club, the southern end of the road, has many scenic features, among them a replica of Lake Killarney of Ireland.

Work Together for Suburban Roads

PHILADELPHIA, March 23—The subject of good roads in Philadelphia was discussed at an informal luncheon at the Union League, yesterday tendered to William H. Connell, chief of the Bureau of Highways. It is the intention of the local authorities to work in harmony with adjoining counties to adopt a uniform system of building country roads and to further the improvement and maintenance of existing thoroughfares leading into and out of the city. While nothing definite resulted, impetus was given to the movement, which has been agitated from time to time by members of automobile clubs and others interested in good roads.

Prominent among those present were Robert P. Hooper, president of the American Automobile Association; Powell Evans, president of the Automobile Club of Philadelphia, and Joseph H. Weeks, president of the Automobile Club of Delaware County.

Urge Feeder to Meridian Road

MINNEAPOLIS, MINN., March 23—The Watertown Automobile Club of South Dakota has written to the Automobile Club of Minneapolis, to start a movement for a Watertown-Minneapolis road. There is much touring between the two cities and Watertown is on the Winnipeg-Galveston meridian road. Secretary A. L. Sherin writes that many tourists going either way on the meridian road would run over to Minneapolis on the proposed route, which leads from Watertown to Gary, then to Clarksfield, Minn., Granite Falls, due east along the Chicago, Milwaukee & St. Paul road. He says, co-operation of intermediate towns is the only necessary thing.



News of the Week Condensed

Pergola built into the showroom of the United Motor Philadelphia Company to set off Stoddard-Dayton Saybrook

SALESROOM DECORATED—Last week was Saybrook Week for the United Motor Philadelphia Company and as a part of the introduction of the Stoddard-Dayton Saybrook model the salesroom was transformed to represent part of a country estate with an Italian pergola on a knoll. This made an effective setting for the display of the cars.

May Buy Motor Truck.—The Water Department, Springfield, O., is considering the purchase of a motor truck.

Garage in Boswell.—P. O. Cover, Boswell, Pa., agent for the Ford, is planning to erect a garage early this spring.

Buy Repair Shops.—Dugger & Willis, Mt. Pleasant, Tenn., have purchased the repair shops of the Mt. Pleasant Auto Machine Company.

New Ashtabula Firm.—The Lyons Cox Company has been formed in Ashtabula, O., to deal in new and second-hand cars and to sell the Little Giant truck.

Jandorf Moves.—The Jandorf Automobile Company, New York City, successor to the Broadway Automobile Exchange, is now in its six-story building at 42-44 West Sixty-second street.

Eveland Appointed.—F. W. Eveland, manager of the A. G. Spalding & Brother Company, Philadelphia, has been appointed secretary-treasurer of the Philadelphia Automobile Trade Association.

Wagner to Build Garage.—Oscar Wagner, Port Allegheny, Pa., is to build a fireproof garage this spring. Machinery will be installed for a repair shop and a stock of supplies will be carried.

Henderson Advertising Changes.—A reorganization of the advertising force of the Henderson Motor Sales Company has taken place in Indianapolis, Ind., since the recent resignation of

Lucius S. French, advertising manager. Homer McKee has become advertising director, while H. C. Bradfield has taken charge of the newspaper advertising.

Adopts Knight Motor.—The Daimler Company, Coventry, England, has adopted the Knight motor for use in four types of heavy-duty engines which will be used in six different types of chasses. Four of them will be for use in commercial vehicles.

Truck for Carpenters.—A motor truck will be purchased by the Marion county commissioners, Indianapolis, Ind., for the use of the county bridge carpenters. The county council has made an appropriation of \$1,000 for the truck.

Baker Agency Changes Hands.—The Indiana agency for Baker electrics, which has been held by K. W. Brewer, has been taken over by E. R. Vincent and D. F. Holliday and moved to the White Motor Company's salesroom in North Delaware street.

Standard Oil Garage.—A \$9,000 garage is being built by the Standard Oil Company in Indianapolis, Ind., the company displacing its horse-drawn equipment with motor equipment in that city. The new garage is to be 38 by 125 feet and will be of steel and brick construction.

Big Toledo Garage.—The Toledo Auto & Garage Company, Toledo, O., has two departments, one for gasoline pleasure cars and trucks and the other for electric types. The gasoline department can accommodate sixty-five cars, while the capacity of the electric department is seventy-five vehicles.

More Automobile Shows.—There is to be an automobile show in the Auditorium at Waterbury, Conn., beginning March 27, and there is to be one at Auburn, Me., April 4, 5 and 6 in Auburn Hall. Vermont's big show is to be held in the armory at Burlington, beginning April 20 and will continue for a week.

Changes Location—Williams Brothers, Boston, Mass., agents for the Cartercar, have moved to 1000 Boylston street.

Opens Garage—H. J. Fledderman has purchased the Casino Rink building, Brookville, Pa., and has opened it as a garage.

Big Road Appropriation—The Saskatchewan Government has made an appropriation of \$5,000,000 for road work in 1912.

Big Garage for Atlantic City—J. F. Taylor is to erect a large garage, to cost between \$60,000 and \$75,000, in Atlantic City, N. J.

LeHardy & Lindsay Move—LeHardy & Lindsay, Rochester, N. Y., representatives of the Marmon, have moved to 308-310 East avenue.

Opens Service Building—The Mitchell Sales Company, Atlantic City, N. J., is about to open a large new service building and salesroom.

New Salesroom Opened—The Osen-McFarland Company, Mitchell agent, San Francisco, Cal., has opened a new salesroom and garage.

Branch Supply House Opened—Green & Sweet, Boston, Mass., have opened a branch of their accessory supply house in Manchester, Mass.

Cartercar Agents Move—Williams & Company, New England agents for the Cartercar, have moved to 998-1000 Boylston street, Boston, Mass.

Trask Leaves Cartercar—Charles A. Trask has resigned his position as chief engineer and works manager of the Cartercar Company, Pontiac, Mich.

Wellsburg to Have Garage—Work has begun on the garage being built in Wellsburg, W. Va., which will be occupied by the Brooks Auto Company.

Woodworth Treads in Europe—A. Hedinger has sailed for Europe to take charge of the business of the Leather Tire Goods Company in Continental Europe.

Williamson to Manage Western—G. H. Williamson has been made sales manager of the Western Automobile Company, in the St. Paul, Minn., territory.

Opens Salesrooms—A. Weisskopf, Milwaukee, Wis., state distributor for the O'Neil Tire protector, has opened salesrooms and a service station on Eighth street.

To Manage Boston Branch—Chester M. McCreery has been made manager of the Boston, Mass., branch of the Goodyear Tire & Rubber Company, Akron, O.

Zanesville Show—The Wedge Garage of Zanesville gave its first annual automobile show in its salesrooms March 18 to 23, inclusive. Perry D. Gath is manager of the concern.

Phelps Leases Building—F. N. Phelps, Boston, Mass., agent for the Baker electric commercial vehicle, has leased a large building which he will have remodeled as a salesroom and service department.

Smith Moves—Harry E. Smith, who recently purchased the stock of motor car parts and accessories of the Early Motor Car Company, Columbus, O., has removed his establishment to 43 West Broad street.

Blandin Retires—F. F. Blandin, who has been president of the Racine Manufacturing Company since its organization, retired from active business in February on account of ill health brought about by overwork.

Doan Resigns—W. B. Doan has resigned as manager of the Boston, Mass., branch of the R. C. H. Corporation, and the office is now in charge of Mr. Jordan, who has been one of the company's traveling representatives.

Want Park Opened—The motorists of New Haven, Conn., have started an agitation looking to the opening of East Rock and West Rock Parks to motor cars this summer. All cars are barred from both parks at present.

Automobile Club Formed—The Conhocton Valley Automobile Club has been organized in Bath, N. Y. C. W. Richardson

is president, D. E. Conine is vice-president, W. K. Lyons, secretary, and W. N. Hallock treasurer.

New Garage at Pulaski—H. W. Steger and F. J. Laughon, proprietors of The Garage, Pulaski, Va., have let the contract for a fireproof garage. Construction is to be commenced at once. The building is to be 50 by 125 feet.

Promotion for Martin—C. W. Martin, Jr., for some time southern district manager for the Goodyear Tire & Rubber Company, with headquarters at Atlanta, Ga., has been appointed manager of the company's motor truck department at Akron, O.

Campaign for New Members—The Massachusetts State A. A. has appointed a committee to get in touch with automobilists throughout the state. The state association now has less than 5,000 members, while there are 35,000 motorists in the state.

Hartford Club to Move—The transition of the Hartford, Conn., Automobile Club from a social organization to one for business purposes only will be marked by the removal of the club quarters about May 1 to new quarters in the Charter Oak building.

Organizing Chauffeurs—Benjamin F. Earl has been busy in New England organizing chauffeurs into chapters of the Chauffeurs' Federation of America, having secured 100 members in Springfield, a large number in Rhode Island and more at Manchester, N. H.

Club Formed in Brookline—A number of Brookline motorists have formed the Brookline Automobile Club. The following officers were elected: Benjamin P. Richardson, president; Lawrence Whitcomb, vice-president; Emmons Raymond, secretary-treasurer.

Springfield to Regulate Taxis—As a result of recommendations made by Police Commissioner Fred O. Clapp, of Springfield, Mass., Aldermen E. S. Goldwaite and H. G. Waters have been appointed a committee to investigate taxicab conditions throughout the city.

Goodyear Anniversary—The Goodyear Tire & Rubber Company, Akron, O., this month celebrates its thirteenth anniversary and the attainment of the million mark in the production of its tires. Three tires a minute for 24 hours of every day are turned out at the factory.

Plan to Build a Truck—The Sheldon is very likely to be the name of the one-ton truck that Wade & Dunton, Lewiston, Me., contemplate building in the near future. Plans for its manufacture have been completed and work will begin to place them on the market for the 1913 season.

Brightwood Consolidated—The Brightwood Motor Manufacturing Company, builder of the Orson car, has been consolidated with the Springfield Metal Body Company, Springfield, Mass. The company will continue building the Orson car and also put out a commercial vehicle.

Limit Oil Storage—An ordinance has been passed by the Common Council of Oshkosh, Wis., limiting the storage of oils. The ordinance provides that: "Within the special limits of the city of Oshkosh, not to exceed twenty barrels of kerosene, carbon oil or lubricating oil may be stored at any one time."

Kline's Pittsburgh Building—The Kline Kar Motor Company, Pittsburgh, Pa., has let the contract for the construction of a large fireproof building to contain salesrooms, offices, garage and repair shop, together with a bureau of touring information. The structure will have a frontage of 80 feet and will cost \$30,000.

Atterbury in Hartford—The Connecticut headquarters for the Atterbury truck are now located in Hartford, Conn., the main office and service station having been removed from Meriden. The company is to be known as the Atterbury Motor Truck Company of Connecticut. Edward J. Ives is the manager. Sub-agencies will be opened in New London, New Haven and Waterbury.



Gathering of 125 Ford dealers from the Grand Rapids district who were guests of the company

Nutt Appointed—L. E. Nutt has been appointed general purchasing agent for the Velie Motor Vehicle Company, Moline, Ill.

Cole Changes Quarters—The New York Sales Company, Cole representative, at Binghamton, N. Y., have moved to 25 Washington street.

To Represent Marion—The W. E. Allen Company has been organized at Milwaukee, Wis., by W. E. Allen to represent the Marion in Wisconsin.

To Build Salesroom—The Western Automobile Company, Franklin dealer in St. Paul, Minn., has broken ground for a modern salesroom in the automobile district.

Garage for Beaver Dam—J. G. Beck, Alvin Beck and Rudolph Beck have organized the Beaver Dam Auto Company, Beaver Dam, Wis., and will open a garage April 1.

Ford Dealers Visit Factory—A large delegation of Ford dealers recently came to Detroit, Mich., to visit the Ford factory. During their stay they were entertained by the company.

Crise Opens Supply House—The agency for Shawmut tires in Baltimore, Md., is in the hands of Howard L. Crise. Mr. Crise has opened a motor car specialties and supply house.

To Represent Mitchell—The Jenkins Automobile Company has been organized in Chippewa Falls, Wis., to represent the Mitchell and to operate a garage. Judge F. W. Jenkins is at the head of the new concern. The garage has dimensions of 60 by 100 feet and is fireproof.

Regal Sales Convention—Representing every district in the United States except the extreme Pacific states, the traveling salesforce of the Regal Motor Car Company recently came together at Detroit for a joint session with the factory sales manager.

Must Pass Quietly—Due to the recent injury of several cavalymen due to the horses being frightened by automobiles, the military authorities at New Orleans, La., have prohibited speeding and the sounding of signals when automobilists pass divisions of cavalry on the road.

Municipal Garage for Boston—Commissioner Louis K. Rourke, of the Boston Public Works Department, has had plans drawn for a municipal garage that he wants to have erected

in the Albany street yards connected with his department at a cost of \$55,000. In his department alone there are 22 motor cars. The plans provide for a concrete structure large enough to house 50 cars.

Automobile Incorporations

AUTOMOBILES AND PARTS

AKRON, O.—Ideal Commercial Company; capital \$200,000; to manufacture and sell commercial cars of all kinds. Incorporators: T. E. Greighton, J. C. Sage.

ATLANTA, GA.—Coward Automobile & Accessory Company; capital \$25,000; to engage in the automobile and accessory business. Incorporators: J. M. Coward, G. S. Peck, J. Pierce.

AUGUSTA, ME.—Omaha Motor Car Company; capital \$1,000,000; to manufacture and sell automobiles. Incorporators: R. S. Buzzell, L. J. Coleman.

BUFFALO, N. Y.—Buffalo Electric Vehicle Company; capital \$1,000,000; to manufacture and sell electric pleasure cars and commercial vehicles. Incorporators: W. P. Seipp, W. C. Feuchter, T. B. Wheeler, F. E. Lane, M. B. Alexander.

CANANDAIGUA, N. Y.—William J. Hawley Automobile Company; capital \$30,000; to engage in the automobile business. Incorporators: E. T. Case, W. J. Hawley, L. H. Hawley.

CHICAGO, ILL.—Chicago Electric Motor Car Company; capital \$110,000; to manufacture automobiles and accessories. Incorporators: D. F. Rosenthal, L. S. Kositchek, J. L. Gossman.

INDIANAPOLIS, IND.—Morris Motor Sales Company; capital \$10,000; to engage in the automobile business. Incorporators: T. H. Morris, P. H. Krauss, F. C. Krauss and others.

NEW YORK CITY—Market & Harlem Auto Trucking Company; capital, \$10,000; to engage in the automobile trucking business. Incorporators: B. Osterhout, J. L. Robinson, W. Eastman.

NEW YORK CITY—Parker J. Manning Auto Company, Inc.; capital, \$500; to engage in the automobile business. Incorporators: P. J. Manning, E. E. Manning, I. Levison.

NEW YORK CITY—Pierce, Wells and Keedwell; capital, \$10,000; to manufacture and deal in automobiles, motors, etc. Incorporators: P. Krulder, Jr., A. C. Keedwell, A. D. Keedwell.

NEW YORK CITY—O. H. Short and Company, Inc.; capital, \$25,000; to manufacture and deal in automobiles, engines, motors, motorcycles, tires and accessories of all kinds. Incorporators: O. H. Short, H. W. Short, H. L. Starr.

NEW YORK CITY—Standard Auto Renting Company; capital, \$10,000; to buy, sell and rent automobiles. Incorporators: W. Machol, E. B. Koenig.

NEW YORK CITY—Washington Square Taxicab Company; capital, \$5,000; to conduct a taxicab business. Incorporators: L. A. Cuneo, W. E. Podesta, F. Cuneo.

ONONDAGO HILL, N. Y.—Boyle Bros. & Pate Company; capital, \$5,000; to do a general automobile repair business. Incorporators: William D. Boyle, Jesse R. Boyle, Albert N. Pate.

SHELBY, O.—Shelby Development Company; capital, \$15,000; to evolve an automobile motor. Incorporators: W. S. Reynolds, J. C. Van Horn, C. S. Moore, T. J. Green, W. H. Myers.

SHREVEPORT, LA.—General Automobile Transfer Company; capital, \$35,000; to do a general transfer business with automobiles. Incorporators: J. H. Orme, H. C. Brewster, H. S. Edwards.

WATERLOO, WIS.—G. H. Hafemeister Motor Company; capital, \$10,000; to manufacture automobiles. Incorporators: G. H. Hafemeister, R. F. Hafemeister, W. M. Wegeman.

Regal Agent Moves—The Regal Sales Company of Philadelphia has removed to larger quarters at Broad and Cherry streets.

Schumacher Sells Out—Charles Schumacher, Manitowoc, Wis., is selling out his stock of accessories and supplies and will retire from the business.

Roach Buys Interest—Theodore B. Roach has purchased the interest of W. F. Copeland, of Jefferson Junction, Wis., in the Copeland-Roach Motor Company.

Remodeling Storeroom—The storeroom at 364 West Market street, York, Pa., is being remodeled and will be occupied by the Auto & Truck Sales Company April 1.

To Remodel Garage—The Anderson Vehicle Company will remodel its large garage at Fond du Lac, Wis., and will build an addition. The present building is 55 by 105 feet.

Franklin to Move—The San Francisco, Cal., branch of the Franklin Automobile Company will be removed on July 1 to new quarters at Polk and McAllister streets.

Students Need No License—According to a decision in City Court, made by Justice Brennan, Buffalo, N. Y., students in automobile schools are allowed to drive a car without a chauffeur's license.

Birmingham Branch Ready—The Birmingham, Ala., branch of the Goodyear Tire & Rubber Company will occupy its new quarters at 420-422 South Twentieth street April 1. The new location is a two-story building, 48 by 90 feet.

Schacht Agency Moves—The Schacht Motor Car Agency, Toledo, O., is now located in its new quarters at 809 Jefferson avenue. The distributing agency for a large tract of Ohio and Michigan territory is under the management of W. D. Neff.

New Supply Houses—Two new automobile supply houses have opened quarters in St. Louis, Mo. They are the Holzman

Auto Supply Company and the National Auto Goods Company, a branch of the Jenkins Auto Supply Company of Sumter, S. C.

Beaver Garage to Open—The Beaver Garage, Beaver Dam, Wis., will be opened in the former gas plant building on April 1. It will be under the management of Frank Cox. A large steam vulcanizing outfit, battery repair and charging plant, and other facilities have been installed.

To Distribute Foreign Cars—The Boulevard Garage & Sales Company, Inc., has opened new showrooms at 1405-1407 Race street, Philadelphia, for the distribution of foreign cars. In addition, the company is also agent, for Pennsylvania, New Jersey & Delaware, of the Lenox car.

Phillips with International Hoist—D. W. Phillips, gas engine designer for the Harder Auto Truck Company, Chicago, Ill., has accepted the position of chief designer for the International Hoist Company, Antigo, Wis. He will have full charge of the gasoline engine manufacturing department.

To Form Club—Newton, Mass., is the next city in the Bay State that will be represented by an automobile club. There is to be a meeting next Friday night, at which President Lewis R. Speare of the Massachusetts State A. A., and James Fortesque, secretary of the association, will address the gathering.

Trucks Selling in New Orleans—The coming of the summer season is doing much to stimulate trade in commercial vehicles in New Orleans, La., according to the dealers. The extreme heat of the summer months is very hard on horses and the evidence that has been furnished for the past several years of the efficiency of motor trucks is having its effect.

H. T. Boulden Honored—The Cincinnati Automobile Dealers' Association recently tendered the press of that city a banquet, at which H. T. Boulden, general sales manager of the Ohio Motor Car Company, Cincinnati, O., was the guest of honor. Mr. Boulden was presented with a handsome gold watch and chain by the dealers in appreciation of his efforts put forth as secretary of the dealers' association.

Lynn Garage Rates Increased—Beginning April 1 the automobile dealers and garage owners of Lynn, Mass., propose to increase their rates for general storage of motor cars. An effort was made to get the Lynn Automobile Dealers' Association to make the rate standard throughout the city, without effect. The proposed new schedule calls for \$8 per month for 25 horsepower car; \$10 for 25 to 35 horsepower, and \$12 per month for all above 35 horsepower.

Invents Rotary Engine—A. H. Foss, Elbow Lake, Minn., has invented a rotary engine, and has obtained a patent that may be operated with either steam or gasoline. It has no crankshaft nor cranks of any kind, no camshaft nor rods. It has revolving intake and exhaust valves. Each cylinder has three pistons; explosions take place in each cylinder at the same time, and there are nine explosions for each revolution. For steam the spark-plugs are replaced by ordinary plugs.

Automobile Incorporations

GARAGES AND ACCESSORIES

BROOKLYN, N. Y.—Alpha Rim Company; capital, \$100,000; to manufacture rims, tires and automobile supplies. Incorporators: Clarence M. O'Donnell, George H. Tice, Max P. Bau.

CHATTANOOGA, TENN.—Citizens' Automobile Company; capital, \$15,000; to conduct a garage business. Incorporators: C. W. Howard and others.

CHICAGO, ILL.—Zilio Tire Company; capital, \$20,000; to manufacture tires and automobile supplies. Incorporators: Jesse O. Barker, F. W. Alexander, F. E. Alexander, Jr.

CINCINNATI, OHIO—Price Hill Auto and Garage Company; capital \$1,000; to do a general garage business. Incorporators: John J. Radel, William J. Wirmel, Steven Radel, John F. Ruehlman, Michael J. Wolfer.

EAU CLAIRE, WIS.—Eau Claire Vulcanizing Company; capital, \$2,000; to establish a tire repair plant and conduct an automobile supply business. Incorporators: F. E. Hall, E. L. Moffitt, B. T. Headley.

HAMMOND, IND.—Frederick L. Heintz; capital, \$100,000; to manufacture automobile tires and accessories. Incorporators: F. L. Heintz, L. M. Heintz, L. G. Vanderveer, Louis Connaghan, Conrad Fischer.

INDIANAPOLIS, IND.—Gilson Motor Starting Company; capital, \$5,000; to manufacture a self starter. Incorporators: R. K. Allison, Bert Gilson, R. B. Allison.

LUNDSBURG, KAN.—Great Eagle Motor Devices Company; capital, \$130,000; to manufacture and sell motor accessories.

MILWAUKEE, WIS.—Chemical Rubber Company; capital, \$150,000; to manufacture a rubber substitute.

MINNEAPOLIS, MINN.—Speed Punctureless Tire Company; capital, \$400,000; to manufacture a punctureproof tire. Incorporators: W. H. Shafer, E. D. Moor, J. P. Ernster.

NEW YORK CITY—Shur-Go Starter Company; capital, \$20,000; to manufacture automobile accessories. Incorporators: James E. Taylor, Theodore C. Le Fevre.

NEW YORK CITY—Standard Resilient Wheel Company; capital, \$500,000; to manufacture tires for automobiles and other vehicles. Incorporators: J. Gaynor, P. B. Verplanck, S. Jochelson.

OMAHA, NEB.—Arthur Storz Auto Supply Company; capital, \$50,000; to deal in automobile supplies. Incorporators: Arthur C. Storz, Hal. M. Brady, D. D. Troup.

SAN FRANCISCO, CAL.—Goodyear Tire and Rubber Company; capital, \$100,000; to manufacture and deal in pneumatic and solid automobile tires. Incorporators: N. B. Taylor, John F. Wise, E. Lingenfelder, H. B. Ball.

WILMINGTON, DEL.—Automobile Tire Filling Company; capital, \$100,000; to manufacture a material for taking the place of inner tubes in tires. Incorporators: M. L. Rogers, S. E. Roberson, H. W. Davis.

WILMINGTON, DEL.—Keystone Vulcanizing Company; capital, \$10,000; to manufacture a vulcanizer for automobile tires. Incorporators: E. E. McWhinney, Wm. J. Maloney, Norman B. Coffin.

INCREASES OF CAPITAL

DETROIT, MICH.—Abbott Motor Company; \$1,050,000 to \$1,500,000.

NEW HAVEN, CONN.—White Motors Company; \$5,000 to \$20,000.



Lincoln-Beachey, the aviator, in Abbott-Detroit submarine

Motor Fire Apparatus

Richmond Adds Motor Engine—The Board of Fire Commissioners, Richmond, Va., has bought a Knox combination motor fire-engine.

Motor Fire-Wagons for Wellesley—An automobile combination fire-wagon is to be purchased by Wellesley, Mass., and the fire department is to be reorganized.

Truck for Framingham—At the last town meeting of the Framingham, Mass., voters it was decided to appropriate \$5,000 for the purchase of an automobile fire-wagon for the Central Fire House.

Benson Buys Fire Truck—The city of Benson, Neb., has purchased a fire truck from the Velie Motor Vehicle Company and plans to equip the fire department entirely with motor apparatus in place of the old horse-drawn equipment.

Brookline Needs Fire-Trucks—Fire Commissioner Estabrook, of Brookline, Mass., fire department, has urged the selectmen to purchase additional motor apparatus for the department. The town now has two motor vehicles in its fire equipment.

Fire-Truck Bids Wanted—As a result of two big fires that burned the town hall and a church the residents of Braintree, Mass., passed a resolution appropriating money to purchase a motor-driven fire-wagon. The selectmen are now looking for bids for the vehicle.

Boston Accepts Fire-Truck—The Boston, Mass., fire department has accepted a motor ladder truck after giving it a tryout in climbing Parker Hill, one of the steepest grades in the city. The big truck made the climb in 3 minutes. The best that horse-drawn apparatus could do was from 6 to 10 minutes.

Motor Fire-Wagon Does Well—The fire department of Catonsville, Md., has found that the motor fire apparatus recently installed there to be a great improvement over that of the old horse-drawn apparatus. The motor car is a combined chemical and pumping engine and was built by the American La France Fire Engine Company.

To Buy Fire-Wagon—The North Attleboro, Mass., fire department has made an appropriation of \$5,500 for the purchase of a new combination chemical and ladder truck to be used at Station 4. It is proposed to get a piece of apparatus similar to that now in use at Attleboro. This truck weighs 8,200 pounds, has a 35-gallon tank, 1,200 feet of hose, one roof ladder and wall ladders.

Interested in Fire-Trucks—Nantucket, the only place under the jurisdiction of Massachusetts where automobiles are prohibited, is awakening to the possibilities of motor vehicles and a committee from the island visited the Boston show to inspect the fire apparatus. The streets of Nantucket have been found too narrow to be practicable for the motor-driven types, however.



Assistant Sales Manager Williams in American Scout

New Automobile Agencies

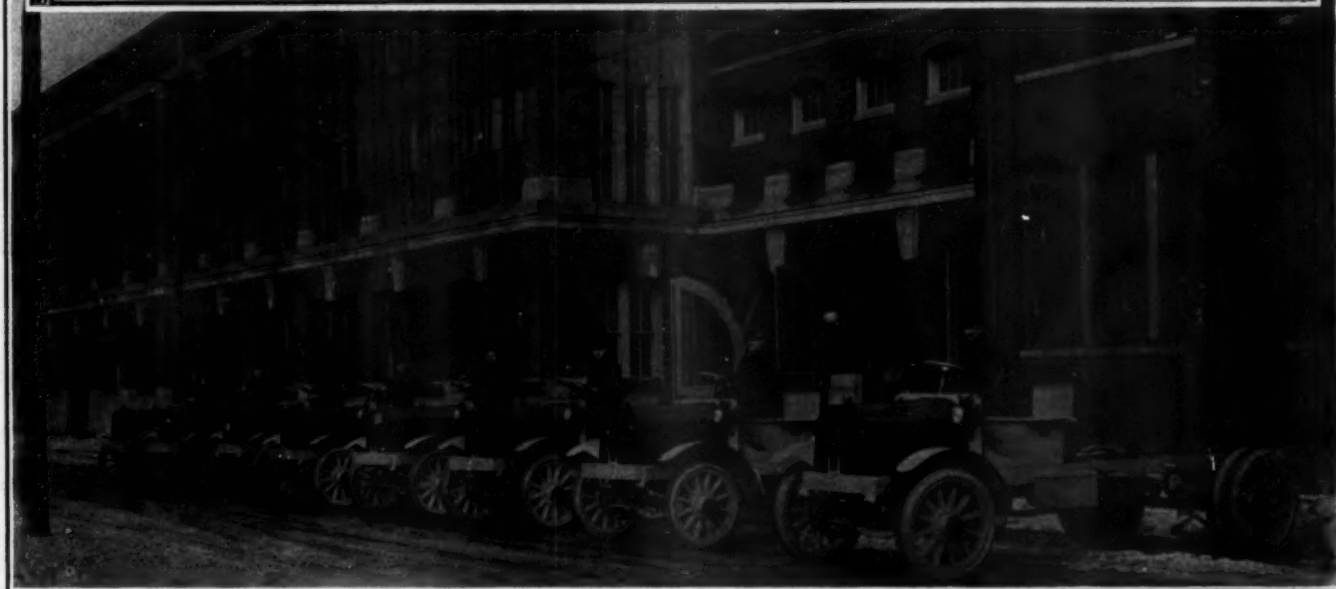
PLEASURE CARS

Place	Car	Agent
Aberdeen, S. D.	Cole	C. E. Barkl.
Alexis, Ill.	Midland	McKelvey & Clark.
Anderson, Ind.	Mitchell	Auto Inn Company.
Auburn, N. Y.	Cole	E. Leonard.
Audubon, Ia.	Cole	E. B. Elliot.
Barberton, O.	Cole	C. H. Schubert.
Binghamton, N. Y.	Alco	H. W. Brown.
Roston, Mass.	Alpana	C. C. B. Merrill.
Chicago, Ill.	Cutting	Dann, Dodge & Company.
Custer, S. D.	Midland	W. M. Lovett.
Davenport, Iowa	Grabowsky	Witt & Lembrecht
Decatur, Ill.	Alco	Augustus R. Staley.
Des Moines, Iowa	Rambler	Des Moines Rambler Co.
Dexter, Me.	Cole	E. B. Blaisdell.
Dorchester, Mass.	Staver	John E. Morrill.
Duluth, Minn.	Cole	Johnson Motor Car Co.
Eau Claire, Wis.	Reo, Rambler, Ford.	A. L. Redmond.
Edmonton, Alberta	Velie	D. J. Latta.
Erie, Pa.	Alco	Park Auto Co.
Eveleth, Minn.	Cole	Eveleth Auto & Repair Co.
Fort Fairfield, Me.	Cole	A. P. Libby.
Galion, O.	Flanders	Clarence Dice
Geneseo, Ill.	Midland	J. L. Lamont.
Hamilton, Ont.	Cole	Patterson Motor Sales Co.
Harrisburg, Pa.	Alco	William J. Mehning.
Haverstraw, N. Y.	Franklin	John W. Gillies.
Indianapolis, Ind.	Stutz	Fischer-Gibson.
Jacksonville, Fla.	Alco	Guy R. Champlain.
Jacksonville, Fla.	Case	J. P. Campbell.
Jerusalem, O.	E-M-F, Flanders.	Brown & Wiley
Kalamazoo, Mich.	Cole	J. H. Penniman.
Kankakee, Ill.	Cole	Fleming & Brown.
Kansas City, Mo.	Stearns-Knight	Holmes and Howe.
Kansas City, Mo.	Ohio	Ohio Motor Sales Co., of Missouri
Kendallville, Ind.	Mitchell	J. T. Reyher.
Ludington, Mich.	Mitchell	Ludington Auto and Supply Co.
Martins Ferry, O.	Cole	E. K. Hoge.
McConnellsville, O.	Ford	Morgan County Garage Co.
Milwaukee, Wis.	Alco	Franklin Auto & Supply Co.
Milwaukee, Wis.	King	Hustis Brothers.
Milwaukee, Wis.	Courier-Clermont	Motor Service Company.
Milwaukee, Wis.	Little Giant.	Chicago Pneumatic Tool Co.
Montgomery, Ala.	Cole	McIntire.
Napa, Cal.	Cole	H. C. Dunlap.
Newark, O.	Overland	T. H. Foos.
New Orleans, La.	Pullman	Warner & Thompson.
Oakland, Ia.	Cole	E. E. Freeman.
Oakville, Wash.	Ford	Oakville Auto Co.
Ogdensburg, N. Y.	Cole	Crescent Garage Company.
Omaha, Neb.	Midland	Freeland Auto Company.
Oneida, N. Y.	Cole	Lloyd's Garage.
Oregon City, Ore.	Cole	G. E. Sullivan.
Peebles Corner, O.	Cole	Cole Motor Sales Co.
Philadelphia, Pa.	Marion	American Automobile Co. of Philadelphia.
Philadelphia	E. O. E.	Steckel Motor Truck Co.
Portsmouth, N. H.	Kissel Kar	W. K. Patterson.
Providence, R. I.	Imperial	Imperial Automobile Co., of New England.
Rapid City, S. D.	Cole	R. L. Holcomb.
Rochester, N. Y.	Havers	C. J. Beardsly Brothers.
Rock Island, Ill.	Ford	Horst & Strieter Auto Co.
San Francisco, Cal.	Alco	Auto Sales Company.
San Francisco, Cal.	Moon	Kiel & Evans Co.
Scio, O.	Mitchell	Marks and Kraft.
Sibley, Ia.	Cole	W. F. Peterson.
Spearfish, S. D.	Midland	C. I. Cooney.
Storm Lake, Ia.	Cole	C. F. Welmerling.
St. Louis, Mo.	Alco, Abbott-Detroit.	Missouri Motor Car Co.
St. Louis, Mo.	Penn.	Ordelheide-Leek Automobile, Livery & Undertaking Co.
St. Louis, Mo.	Imperial	Imperial Automobile Co.
Tacoma, Wash.	Apperson	Elmore-Hupmobile Agency.
Talledega, Ala.	Cole	Northern Automobile Agency.
Tokio, Japan	Packard	Sale & Frazar, Ltd.
Toledo, O.	Halladay	National Motor Sales Co.
Toledo, O.	Cino, Alco	Rambler Motor Sales Co.
Toronto, Can.	Alco	T. A. Crow.
Urichville, O.	Rambler	C. E. Molesworth.
Wadsworth, O.	Ford	S. H. Hockensmith.
Waterloo, Ia.	Cole	A. L. Alexander.
Watertown, N. Y.	Cole	C. R. Wise.
Wilkes-Barre, Pa.	Kline	Gilbert H. Edgar.
Wilkes-Barre, Pa.	Velie	Wyoming Val. Motor Car Co.
Wilkes-Barre, Pa.	Lincoln	S. Reese Machine & Tool Works.
Williamsport, Pa.	Cole	Central Garage.
Winnipeg, Man.	Commer	Darwen Motor Truck Co.
Woodsfield, O.	Ford	Troutman Garage.
Worcester, Mass.	Pullman	Malcom Burbank.
York, Pa.	Reo, Crawford, Overland, Oakland.	John Y. Burgard.

COMMERCIAL VEHICLES

Boston, Mass.	Lauth-Juergens	Meyer, Abrams & Co.
Dallas, Tex.	Alco	Levy-Kramer Automobile Co.
Minneapolis, Minn.	Lincoln	A. F. Chase & Co.
San Antonio, Tex.	Alco	Peden Iron & Steel Co.
San Francisco, Cal.	Johnson	Thompson Brothers.
Windsor, Ont., Can.	Lincoln	Windsor Manufacturing Co.

Of Interest to the Industry



Fleet of Peerless trucks about to be shipped from the Cleveland factory for use in New York City

PEERLESS DELIVERS TRUCKS—The Peerless Motor Car Company, Cleveland, O., recently delivered eight trucks of an order of eleven placed by the American Express Company, which has had five Peerless trucks in operation for some time. The new machines will be used in express work in New York City.

Ford Assembling Plant—The Ford Motor Company, Detroit, Mich., is to establish an assembling plant in Seattle, Wash., this spring.

Rebuilds Shop—Andrew Heim, Marinette, Wis., has rebuilt his painting and trimming shop, recently destroyed by fire. He specializes in automobile work.

To Add Rod Mill—The Kenosha branch of the American Brass Company, Kenosha, Wis., will be equipped with a large rod mill during the present year.

Time Office for Loco—The Locomobile Company, Bridgeport, Conn., is having a large frame building completed for use as a time office. It will be finished early this summer.

New Power Plant for Dorris—The Dorris Motor Car Company, St. Louis, Mo., has completed plans for the immediate erection of a new power plant adjoining the present factory.

Kelsey to Enlarge—The Kelsey Wheel Company, Detroit, Mich., manufacturer of automobile wheels, has taken out a permit for the erection of two one-story brick factory buildings.

To Establish Plant—The Palace Motor Car Company is the latest automobile company to locate in the Pittsburgh district. A plant will be established at Rochester, Pa., to manufacture the Palace 40.

Suburban Has Site—The Suburban Motor Car Company, recently incorporated with \$500,000 capital, has acquired a tract of 250 acres in Ecorse, a Detroit, Mich., suburb, on which it will locate its automobile plant.

Form Vulcanizing Company—F. E. Hall, of Eau Claire, Wis., has organized the Eau Claire Vulcanizing Company, in company with E. L. Moffitt and B. F. Headley, and will establish a large tire repair plant and agency.

Wants Truck Factory—The Davenport Industrial Investment Company has been instrumental in bringing several factories to Davenport, Ia. and is making strenuous efforts to bring an automobile truck factory to that city.

Pullman Adds Night Force—Owing to the greatly increased orders and the demand for early shipments, the Pullman Motor Car Company, York, Pa., has been forced to add a night crew and the factory is running day and night.

Velie in Truck Factory—The Velie Motor Vehicle Company is now occupying its new truck factory at Twenty-fifth street, Moline, Ill., and all of the trucks will now be manufactured there. The new factory represents an expenditure of \$150,000.

Frontier Buys Stock—The Frontier Tire & Rubber Company, Buffalo, N. Y., recently purchased the stock of the Newark Rubber Company, Newark, N. J. The stock consisted of large machinery and equipment, necessary for rubber tire manufacturing and also some raw stock.

Pope to Enlarge—With the proceeds of the \$1,000,000 note recently disposed of to Boston and New York bankers the Pope Manufacturing Company will enlarge its works in Hartford, Conn. Plans have been prepared for a concrete, four-story addition which will afford 60,000 feet of additional floor space for manufacturing purposes.

Seeking Factory Site—The St. Paul Rim & Axle Company, \$100,000 capital, is said to be seeking a factory site in the Midway district, St. Paul, Minn., for a factory to manufacture, among other things, a system of parts by which tires may be demounted with the present equipment of rims. The factory will also do drop forging.

Continental's Detroit Branch—Announcement is made by the Continental Motor Manufacturing Company that its Detroit, Mich., branch will be opened between April 1 and April 15. The establishment at Muskegon, Mich., will be continued. When started, the Detroit plant will be used first to produce 10,000 motors for the Hudson Motor Car Company.

Newest Ideas Among the Accessories

High-Speed Electric Starter; Automatic Carbureter; Ford Electric Lighting Outfit;
All-Brass Tire Pump; Tire Filler; Automatic Tail Searchlight;
Interchangeable Spark-Plug

Hartford Electric Starter-Lighter

A NEW combination electric lighting and starting system has been developed by Edward V. Hartford, of the Hartford Suspension Company, Jersey City, N. J. The system consists of a small dynamo, connected by a cutout and switch to the battery and a small high-speed electric motor. The dynamo generates current at car speeds of 10 miles an hour and above, charging the storage battery and through the same operating the lights. The dynamo cuts out at the car speed mentioned when the storage battery takes up the work of supplying current to the lights.

The battery delivers a 12-volt current to a motor, Fig. 6, which is 4 1-2 inches in diameter, 7 1-2 inches long and weighs 35 pounds including all the necessary gearings. For a car of more than 50 horsepower the diameter of the electric motor is 5 inches and the length 8 inches. The motor drives, by means of a worm and a spur gear, the engine shaft, the ratio of reduction being 125 to 1. The electric motor is equipped with a fly-wheel weighing about 2 pounds and having a diameter of 4 inches. The current flows to the motor from the battery, being controlled by a push button on the dash. The speed of the electric motor is from 6,000 to 8,000 revolutions per minute. At 8,000 revolutions, the main engine shaft is turned over sixty-four times a minute, which is sufficient to start the engine.

The spur gear actuating the main shaft runs on ball bearings and contains a small clutch; the latter is disengaged as soon as the engine starts. The worm gear, on the electric motor shaft is not keyed to the same, but is connected to it by a small friction disk and spider spring recalling the construction of the Hartford-Truffault shock-absorber. The spider spring insures a sufficient tension to permit of the drive being taken from the motor to the spurgear; but if a shock is imparted to the worm gear shaft by a kick-back from the automobile engine, the gear slips on the shaft, so that the motor is not injured.

Scott Double Needle Carbureter

A novel type of automatic carbureter is shown in Fig. 1, this being the model F made by the Scott & Sons Company, Medford, Mass. The carbureter, styled the Scott double-needle carbureter, is of the concentric float type, and the automatic feature of it lies in the use of a needle valve which at high speeds increases the flow of gasoline to the motor in proportion to the air sucked in.

The gasoline is admitted through the passage governed by the needle valve H which is connected to the metal float G surrounding the venturi tube. The gasoline rises in the float chamber to the level of the needle N by means of which the size of the spray nozzle is regulated. The mixture travels through the hollow conical valve D and the port L, thence through throttled passage to the motor. A is a starting valve which is pulled out before starting the engine.

By pulling the valve A out of its normal position a vacuum is created directly beneath the throttle, which starts the flow of gasoline from the spray nozzle N. Starting valve A is actuated either by a rod through the radiator or by a lever from the dash. After the engine has started the valve is returned to its normal position.

In adjusting the carbureter, A is pulled out, the engine is started and the throttle half opened. Then C is adjusted to give a good mixture, the carbureter operating at low speed during this process. To adjust it for high speeds the throttle is opened and the valve B adjusted to overcome backfiring into the carbureter and to obtain the proper mixture. B governs the amount of suction necessary to depress the valve D off its seat and thereby give a correct mixture at high speeds.

The high-speed gasoline adjustment operates as follows: As the suction of the motor is increased by opening the throttle, a vacuum is created within the carbureter mixing chamber, and the atmospheric pressure outside of the carbureter depresses the

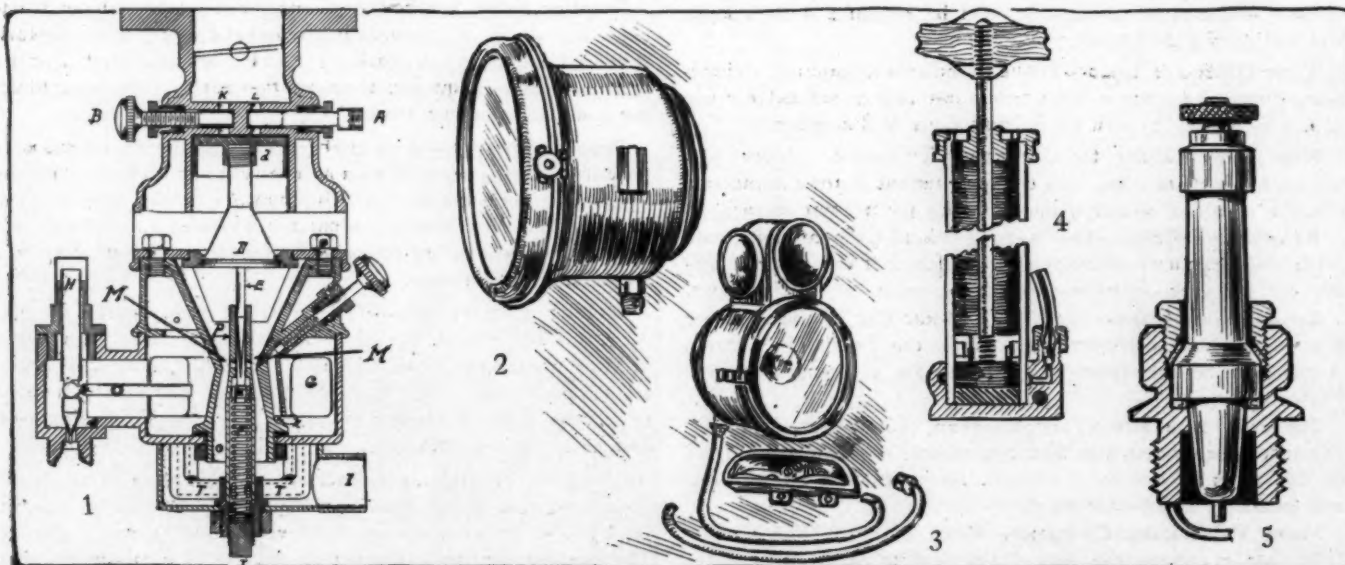


Fig. 1—Scott double-needle carbureter. Fig. 2—XL Ford headlight. Fig. 3—Bac 2 Lite automatic rear flash. Fig. 4—Pitner tire pump. Fig. 5—Rex spark-plug

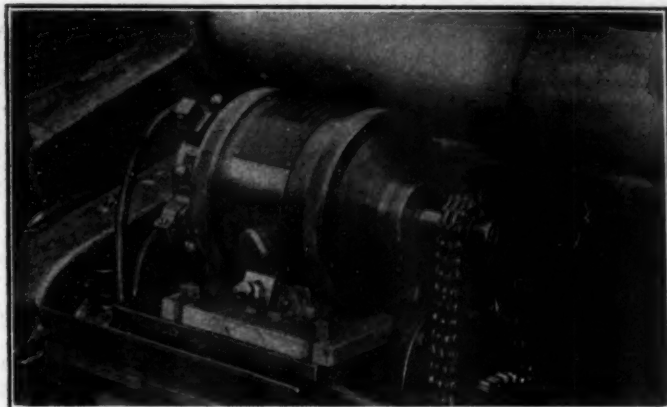


Fig. 6—Hartford lighting dynamo and silent-chain drive

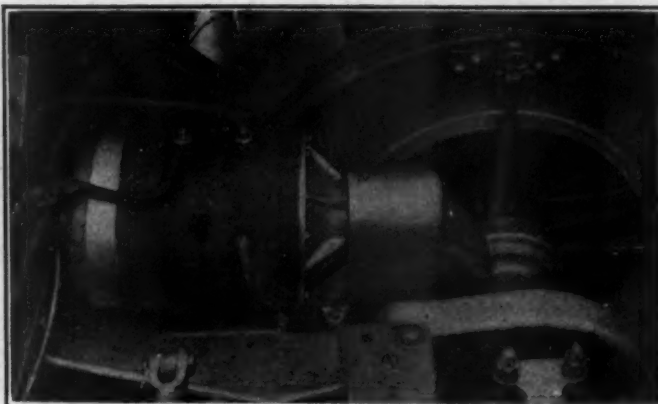


Fig. 7—Hartford electric torque generator and engine starter

valve V and the needle E attached to it. Air rushes in through S and rises under D, and this suction draws gasoline out of the auxiliary gas ports M M in proportion to the auxiliary air. The further E is depressed, the greater becomes the suction, increasing the pressure on the gasoline which is thereby forced out through the ports M M.

The carbureter is hot-air jacketed to pre-heat the mixture, the heating air entering the jacket at I.

XL Ford Searchlights

Taking advantage of the large current-generating capacity of the Ford magneto, the Auto Improvements Company, Bristol, R. I., has entered the ranks of makers of electric lights for Ford cars by placing on the market a lighting system comprising a pair of 8-inch headlights, Fig. 2, two tungsten side lights, a push-button switch, and the insulated wire necessary for connecting these units to the magneto contained in the flywheel. All headlights are equipped with Edison or Bayonet sockets, according to the purchaser's wishes. The headlights are furnished either in black enamel with brass trimmings, or all brass, the former style having the advantage that it requires practically no cleaning. A detailed instruction sheet is furnished with the outfit, so that the buyer himself may install the equipment on his car.

Pitner Tire Pump

A tire pump which is claimed to transform 98 per cent. of the operator's energy into air pressure, is made by the Pitner Pump Company, Chicago, Ill. The device shown in Fig. 4 consists of a cylinder 2 feet high, a base, a piston and plunger and a handle. Cylinder, base and piston are of brass, while the handle is of seasoned hardwood driven into a brass collar. The wood and the lower portion of the brass collar are drilled and threaded to give a tight fit for the screw-threaded end of the hard steel plunger, the thread being 1 3/8 inches long. The top of the cylinder or pump barrel is closed by a cap which is turned out of solid brass, threaded to screw onto the top of the barrel and provided with a central bearing for the piston rod or plunger. The bearing, like the plunger, is of hardened steel and securely screwed into the cap. Holes in the cap permit of air entering the chamber above the piston. The piston is made of a solid brass disk, screwed on the plunger and having a clearance of but 4-1000 inch at its circumference. A hole in the piston provides a passageway for the air from the chamber above the piston into that below it; on the rapid downstroke of the pump this hole is tightly closed by a ball check, so that the air below the piston is compressed. The ball is retained by the head of a bolt screwed into the lower face of the piston, and when the latter starts suddenly on its downstroke the ball is thrown against the valve seat by its inertia. To insure positive tightness of the piston against the pump barrel, a leather packing-ring is laid in a groove around its periphery, and there are passages from the compression chamber to the space in which the leather ring is contained so that whenever air is compressed in the pump, some of it is

forced into the groove and presses the leather against the barrel, increasing the tightness of its fit. On the other hand, when, with the piston traveling upward, a slight vacuum is created in the space below the piston, the leather is sucked off the wall, so that no friction occurs on the upstroke. The outlet from the compression chamber, closed against air from outside by a ball check, is located 1-16 inch above the felt-covered bottom of the cylinder. This feature insures the presence, at all times, of an air cushion between piston and base, so that the former never even strikes the felt cover, thereby saving the mechanism from shock.

To give a tight connection between the pump and the hose connecting it to the tire a Pitner hose connection is provided. This compresses the hose material between a central piece of metal tubing and a screw cap fitting on the outlet of the pump. The pump is equipped with a hinged foot-piece, which folds up when the pump is not in use. The pump is guaranteed for 5 years.

Essenkay Tire Filler

A substitute for the air which is nowadays used for inflating inner tubes is being marketed by the S. & K. Tire System, 2021 Michigan avenue, Chicago, under the name of Essenkay. It is a cheese-colored material lending itself to be molded into any shape and size, so that it can be placed in tire casings instead of the rubber tires. Essenkay offers hardly any resistance to a slight compressive stress, but strongly resists a powerful compression; furthermore, it is claimed to be as resilient as air and not to deteriorate with age.

Bac 2 Lite Automatic Rear Flash

A combination of the tail light required by the law of most states and of a searchlight illuminating the path of the car when moving backward is being placed on the market under the trade name of Bac 2 Lite. This outfit, Fig. 3, consists of a 4-candlepower tail light mounted upon the body of a 15-candlepower lamp which is equipped with a highly polished reflector. These two lamps are connected to the dynamo or storage battery, so that when the regular light switch is thrown on the tail lamp is lighted. The lower and more powerful lamp remains out of circuit until the car is moved backward, when an automatic switch throws the rear searchlight into operation. The device is made by the Bac 2 Lite Company, of 104 S. Jefferson Street, Dayton, O.

Rex Spark-Plug

The Rex spark-plug, Fig. 5, made by the Rex Ignition Company, 1779 Broadway, New York City, is designed for hard service, and its makers claim it to be sootproof. A porcelain of high electrical resistance is fitted into the shell, being made interchangeable, so that in case of a porcelain breaking down a reserve piece can be obtained at half the price of a complete spark-plug. The wire electrodes are of imported metal. The plug comes in standard and A. L. A. M. sizes.

Patents Gone to Issue

SPRING VEHICLE—In which the suspension is pneumatic throughout, and the construction of the frame is adapted to this feature.

Fig. 1 shows a frame having transversely severed sidebars in combination with a running gear. The frame is supported on the running gear by means of pneumatic cylinders P, the weight of the body being applied to the upper ends of the cylinders by upward-projecting brackets, which are inserted between the sections of the sidebars and are secured thereto by forward and rearward attaching projections which overlap the above-mentioned sections of the sidebars.

No. 1,020,209—to Richard Liebau, Watervliet, N. Y. Granted March 12, 1912; filed July 27, 1910.

Muffler—In which the gases are forced to follow a zigzag path.

The muffler, Fig. 2, described in this patent consists of a housing, with an inlet I and an outlet O, which contains a number of perforated diaphragms. Two different types of diaphragms, A and B, are arranged alternately, the type A having one large opening in its center and the type B a number of small apertures near its periphery. All openings are provided with a flange on the side facing the inlet of the muffler so as to make the path of the hot gases more tortuous.

No. 1,020,163—to George F. Swain, Chicago, Ill. Granted March 12, 1912; filed April 6, 1910.

Rotary Valve Engine—In which a rotary valve cylinder connects compression and combustion chambers.

This patent refers to an engine, Fig. 3, comprising a number of power cylinders and pump cylinders. The pump cylinders are brought in communication with a carbureter at proper intervals. The mixture drawn from the carbureter is compressed by the pumps and delivered by them through channels to a rotary intake valve R, contained in a valve chamber V, and thence through ports into the compression chamber C. The compression chamber in turn is in communication with the working cylinders. Packing rings are provided between the ends of the channels connecting each pump cylinder with the compression chamber.

No. 1,020,128—to David H. Coles, Brooklyn, N. Y., and Frederick Charavay, Jersey City, N. J., assignors to Requa Motor Company, New York City. Granted March 12, 1912; filed May 13, 1910.

Dirigible Headlights—A mechanism directing the light at all times in the path of the front wheels and regulated by a connection to the steering gear.

This patent relates to a dirigible arrangement of automobile headlights, Fig. 4, in which the lamps are pivotally connected to a frame, one of the lamps having a downward projecting arm which has a socket S in its terminal. A forked coupling member F has its upper end pivoted to the socket and one end of a rod hinged to its forks. The other end of this rod is hinged in the forks of a second coupling F₁, the end of which is pivoted to a crossbar connected to the steering mechanism M. Brackets are secured to the rear faces of the lamps and the ends of a cross-rod are pivoted in these brackets so that both lamps are operated simultaneously by the steering mechanism, when the latter turns the wheels.

No. 1,019,976—to James L. Lowe, Moore, Mont. Granted March 12, 1912; filed November 29, 1910.

Spring Tire—Composed of elements in which a coiled spring and a metal lining are used instead of a pneumatic inner tube.

This patent relates to the construction of a tire composed of a casing and a metal lining bearing against its inner tread. A coiled spring in the casing bears with one end against the metal lining, while its other end is elongated through the rim and felloe and is provided with left-hand screw threads; a clamping member comprising a hollow stem having external, right-hand screw threads is mounted on the extension of the coil spring. There is a base for this stem, on which base outward and downward extending flanges are formed, and a turnbuckle nut is in engagement with the stem of the clamping member and the extension of the coiled spring, so as to clamp the tire securely to the rim.

No. 1,019,973—to John F. Lieb, Philadelphia, Pa. Granted March 12, 1912; filed February 6, 1911.

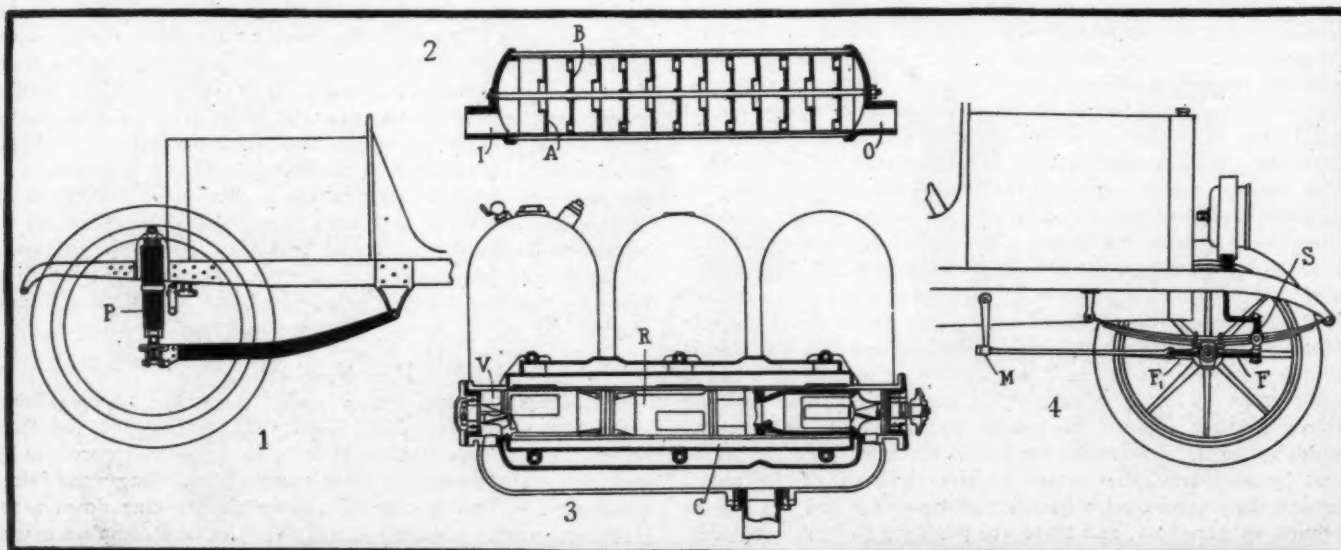


Fig. 1—Liebau spring vehicle. Fig. 2—Swain muffler. Fig. 3—Coles-Charavay rotary valve motor. Fig. 4—Lowe dirigible headlights